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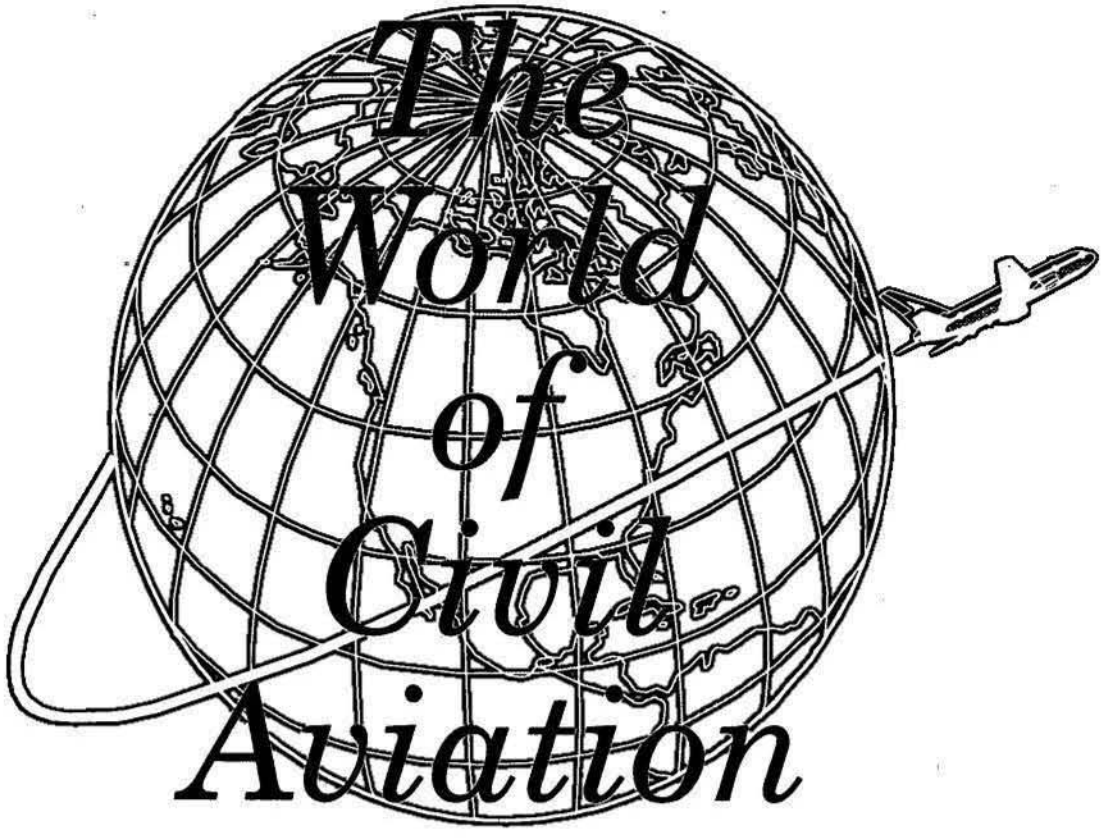

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11/94

HIGHLIGHTS

DURING 1994 ...

The world economy continued to recover ...

The world's Gross Domestic Product (GDP) grew by an estimated 2.8 per cent in real terms. On a regional basis the change in GDP ranged from an estimated increase of nearly 5 per cent for Latin America and the Caribbean to a decrease of about 2 per cent for Europe, the latter being adversely affected by the poor economic performance of the former centrally planned economies in eastern Europe (see Chapter 1).

The pace of liberalization of international air services varied ...

Several States announced policy initiatives towards greater liberalization. Bilateral efforts to expand air services moved ahead in some instances and were suspended in others; regional regulatory regimes focused on specific issues such as state aids and ground handling. The Uruguay Round of trade negotiations was formally concluded. The resulting General Agreement on Trade in Services (GATS) which excluded air traffic rights but included three other aspects of international air transport was to enter into force, along with the establishment of the supervisory World Trade Organization, on 1 January 1995 (Chapter 2).

ICAO examined present and future regulatory arrangements ...

The World-wide Air Transport Conference recognized important principles for the evolution of economic regulation of international air transport such as the effective participation of all States, safeguarded change and respect for existing rights; reached conclusions on ten regulatory arrangements for the use of States and identified eight important issues for further study (Chapter 2).

Airline privatization slowed ...

Only a few new privatization objectives were made known while slow progress was made in the privatization of several airlines (Chapter 2).

... but foreign investment in airlines did not ...

Airlines continued to expand transnational alliances, including code-sharing, joint services, and joint participation in frequent flyer programmes (Chapter 2).

Airline traffic showed sustained growth ...

Over-all scheduled passenger/freight/mail tonne-kilometres performed were up by 9 per cent and international tonne-kilometres by 10 per cent. There were significant differences in the traffic growth between regions, ranging from increases in total traffic of about 5 per cent in Latin America/Caribbean to almost 13 per cent in Asia/Pacific (Chapter 2).

... and finances improved ...

Preliminary estimates indicate that the world's scheduled airlines as a whole experienced an operating profit (of 3.2 per cent of operating revenues) for the second year in succession following three years of operating losses (1990-1992) (Chapter 2).

... but aircraft orders did not ...

The number of turbo-jet aircraft ordered was 306 compared to 341 in 1994. The financial commitment for orders placed for these aircraft in 1994 is estimated to be about U.S.$14 billion, somewhat less than the U.S.$17 billion estimated for 1993 (Chapter 2).

Airport construction continued ...

Three new international airports opened (Osaka in Japan, Al Ain in Abu Dhabi, United Arab Emirates, and Sanya in China), construction on a number of other new airports continued and major expansion projects were under way in all regions. The evolution of autonomous authorities to operate airports and air navigation facility services also continued (Chapter 3).

Planning to implement a satellite-based navigation system continued ...

Significant progress was made by a number of States and international organizations in the planning and development for the implementation of a global satellite-based Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) system to replace existing line-of-sight ones (Chapter 3).

... meanwhile existing air navigation facilities and services were enhanced ...

Air traffic control systems around the world were being updated as part of the evolution process to a global ATM system. Meteorological services were also enhanced through the use of automated weather stations and computer generated weather forecasts (Chapter 3).

Safety remained a top priority ...

Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services shows that there were 28 fatal aircraft accidents involving 941 passenger fatalities in 1994 compared to 34 fatal accidents and 936 passenger fatalities in 1993. The number of passenger fatalities per 100 million passenger-kilometres remained at 0.05 as in 1993. During the year

ICAO recognized the need to improve, at a global level, government oversight in the implementation of air safety standards (Chapter 4).

Security continued to be a major issue ...

There was no significant change in the number of acts of unlawful interference. In 1994 there were thirty-one such incidents compared with twenty-nine in 1993 (Chapter 4).

Efforts to automate clearance procedures continued ...

States continued their efforts to streamline border crossing procedures for passengers and cargo through the use of new technologies, such as biometric identification and machine verification of documents (Chapter 4).

... as did environmental impact studies ...

ICAO continued to review the actions needed to control the effects of aircraft engine emissions around airports and in the upper atmosphere as well as what progress can be made to further reduce aircraft noise (Chapter 4).

BETWEEN 1994 AND 1997 ...

Airline traffic is expected to continue to grow ...

Total scheduled passenger traffic (in terms of passenger-kilometres performed) is expected to grow at just under 7 per cent each year over the period 1995 to 1997 (Chapter 5).

Airline finances should show gradual improvement ...

Scheduled airline revenues (including revenues from freight, mail and other sources as well as from passengers) are estimated to increase at an average of just under 10 per cent each year, whereas airline expenses are expected to grow at an average of some 9.5 per cent per annum (Chapter 5).

Regional differences in traffic growth will remain ...

The passenger traffic of airlines of Asia/Pacific is expected to show the highest annual average growth, over 9 per cent, compared with an annual average growth rate of just under 7 per cent for the world. The passenger traffic of airlines of Europe and the Middle East regions is expected to grow at about the world's annual average growth rate, and that of the airlines of North America, Latin America and the Caribbean, and African regions is expected to grow at an average rate of around 5 or 6 per cent per year (Chapter 6).

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FOREWORD

Introduction

1. This circular, *The World of Civil Aviation — 1994 to 1997*, is the third in an annual series of publications covering recent and future developments in civil aviation; the developments for the periods 1992-1995 and 1993-1996 were published in Circulars 244 and 250, respectively. In the present circular, Part I reviews the main events in or affecting international civil aviation in 1994. Part II analyses trends in the world economy and the air transport industry and presents global forecasts of airline scheduled passenger traffic through to 1997. Part III reviews, on a region-by-region basis, the year 1994 and gives prospects through to 1997.

2. More extensive aviation statistics for the year 1994 may be found in the ICAO statistical yearbook, *Civil Aviation Statistics of the World, 1994* (Doc 9180/20), a compendium of the key statistics published in the various ICAO Digests of Statistics. Other annual publications of the Organization which complement and supplement *The World of Civil Aviation* are the *Surveys of International Air Transport Fares and Rates* and the studies of *Regional Differences in Fares, Rates and Costs for International Air Transport.* Finally, the medium-term forecasts in *The World of Civil Aviation* are complemented by longer-term and more extensive forecasts published biennially or triennially, the most recent publication being the *Outlook for Air Transport to the Year 2003* (Circular 252).

3. A *Catalogue of ICAO Publications and Audio Visual Training Aids* is available on request from:

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Sources

4. In addition to the Digests of Statistics and other ICAO publications referred to above, sources of information for *The World of Civil Aviation* include relevant and most recently available statistical publications of the United Nations; the United Nations Conference on Trade and Development (UNCTAD); the International Monetary Fund (IMF); the World Bank; the World Tourism Organization (WTO); the Organization for Economic Co-operation and

Development (OECD); the European Civil Aviation Conference (ECAC); the United States Department of Transportation (DOT); the Airports Council International (ACI); the International Air Transport Association (IATA); the Association of European Airlines (AEA); and Wharton Econometrics Forecasting Associates (WEFA).

5. Another source of information used for *The World of Civil Aviation* was the large and constantly updated collection of research material on hand at ICAO, including completed ICAO studies, periodical and occasional publications of national administrations and international organizations, studies prepared by research agencies and individuals, and the aviation press. Finally, an information collection exercise specifically for *The World of Civil Aviation* was carried out through the seven ICAO Regional Offices, in some cases including questionnaires addressed to States in the region concerned.

6. The statistical data for 1994 appearing in this circular are to be considered as preliminary: experience shows that the margin of error for world totals is probably less than 2 per cent, except in the case of profit margins where it may be considerably higher. *Unless otherwise noted:*

a) all statistical data are applicable to ICAO Contracting States (183 at the end of 1994);

b) regional breakdowns are by ICAO statistical region (see map preceding Chapter 6);

c) traffic statistics are for revenue scheduled services;

d) total airline financial statistics relate to non-scheduled as well as scheduled operations of scheduled airlines.

e) the expression "tonne-kilometre" means metric tonne-kilometre; and

f) the word "billion" means one thousand million.

Monetary Unit

7. Unless indicated otherwise, all references in this circular to "cents" mean "U.S. cents", and all references to "$" mean "U.S. dollars".

TABLE OF CONTENTS

PART II — WORLD OUTLOOK TO 1997

PART III — REGIONAL PERSPECTIVES, 1994 TO 1997

APPENDICES

PART I

THE WORLD IN 1994

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Chapter 1
Economic Influences

1.1 While growth in air traffic has historically been much greater than growth in the economy, there is a strong correlation between the two and the demand for air transport is primarily determined by economic development. Developments in personal income affect the level of purchasing power and the propensity to undertake leisure travel in general and air travel in particular. Commercial activity and trade have a direct impact on the demand for business travel and for air freight.

1.2 Crude oil prices play a key role not only in the health of the world economy, but also in air carrier costs (fuel costs have ranged between 12 and 25 per cent of scheduled airline operating costs over the past decade). Inflation, interest rates and currency markets are among other important factors which affect the world economy in general and international aviation in particular.

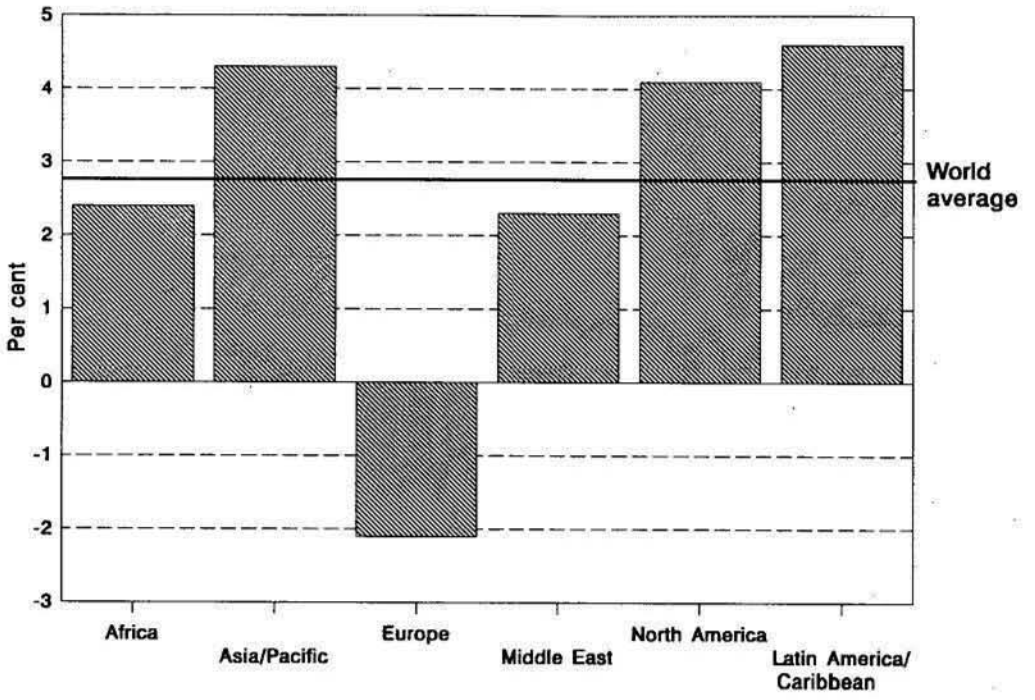
1.3 As background to the analysis of the world of civil aviation in 1994, which follows in Chapters 2 to 4, this chapter reviews developments in 1994 in world economic output, trade and international tourism; in inflation, interest rates and currency markets; and in crude oil and jet fuel prices.

GROSS DOMESTIC PRODUCT

1.4 In 1994 the world's Gross Domestic Product (GDP), which is the broadest available measure of economic activity, grew by an estimated 2.8 per cent. Developed countries, as a group, emerged fully from recession with GDP growing about 3 per cent.

1.5 The North American economy approached its capacity and the authorities began to tighten monetary policy in order to restrain future demand. Recovery became established in Western European countries, but capacity constraints were generally not in evidence. Recovery was slower than had been expected in Japan.

1.6 In much of the developing world, conditions were relatively buoyant in 1994. Economic expansion was greatest in the countries of East and South-East Asia, but also substantial in Latin America. The developing countries of Africa had a better year in 1994. Although recovery commenced in other formerly centrally planned economies of eastern Europe, the Commonwealth of Independent States (CIS) experienced another severe decline in output in 1994. Figure 1-1 illustrates the relative regional economic growth rates in 1994 for the ICAO statistical regions.



Source: ICAO estimates based on the Organization of Economic Co-operation and Development (OECD), the International Monetary Fund (IMF), Wharton Econometrics Services and other economic sources.

Figure 1-1. Annual change in real GDP, 1994/1993

1.7 The diverse economic experience was a factor in the wide variations in air carrier traffic development in 1994, illustrated particularly by the contrast between buoyant economic and traffic performance in much of the Asia/Pacific region and the declines in the CIS. While the relationship between economic growth and air traffic demand is powerful, the link between economic growth in a region and the traffic of airlines registered in the region is becoming more complex as regulatory conditions, airline alliances and market shares change in an increasingly competitive environment. Chapters 5 and 6 discuss economic trends and their impact on traffic; the traffic forecasts presented there take into account the economic outlook for the next three years.

TRADE DEVELOPMENTS

1.8 The strong economic performance in North America and the developing countries of Asia/Pacific helped to produce a greatly improved performance in international trade in 1994. According to recent IMF estimates, world trade grew by more than 9 per cent in 1994 compared

with 3.8 per cent in 1993. The exports of industrial countries (as a group) and developing countries both expanded vigorously, and there was also a rapid expansion of trade in services, such as financial and communications services. These trends in international trade and current account transactions have generally had a positive impact on international air freight demand and business travel.

1.9 The progressive liberalization of trade at both the global and regional levels is serving to stimulate trade and economic growth and hence international traffic demand over the long term. New world trading arrangements agreed in 1994 (see Chapter 2), encompassing trade in services for the first time, will foster further liberalization. Regulatory trends within the air transport industry itself, generally in the direction of greater liberalization as discussed in Chapter 2, could also have a direct positive effect on traffic demand in the long term.

TOURISM

1.10 The demand for international air travel derives in part from the demand for international tourism. Preliminary estimates of the World Tourism Organization (WTO) indicate that international tourist arrivals grew by a moderate 3 per cent and tourist receipts by about 5 per cent in 1994. The WTO's East Asia/Pacific region showed the largest increase in tourist arrivals (7.6 per cent), from a combined increase in intra-regional and long distance travel. The Middle East experienced a decline in arrivals in 1994.

INFLATION, INTEREST RATES AND CURRENCY MARKETS

1.11 Average inflation in industrial countries declined from 3 per cent in 1993 to about 2.4 per cent in 1994, the lowest rate for many years. In this environment, cost pressures on the airlines of the developed world were subdued. On the other hand, a number of developing countries were subjected to high and increasing inflation, and inflation in the countries in economic transition in eastern Europe and the CIS remained very high.

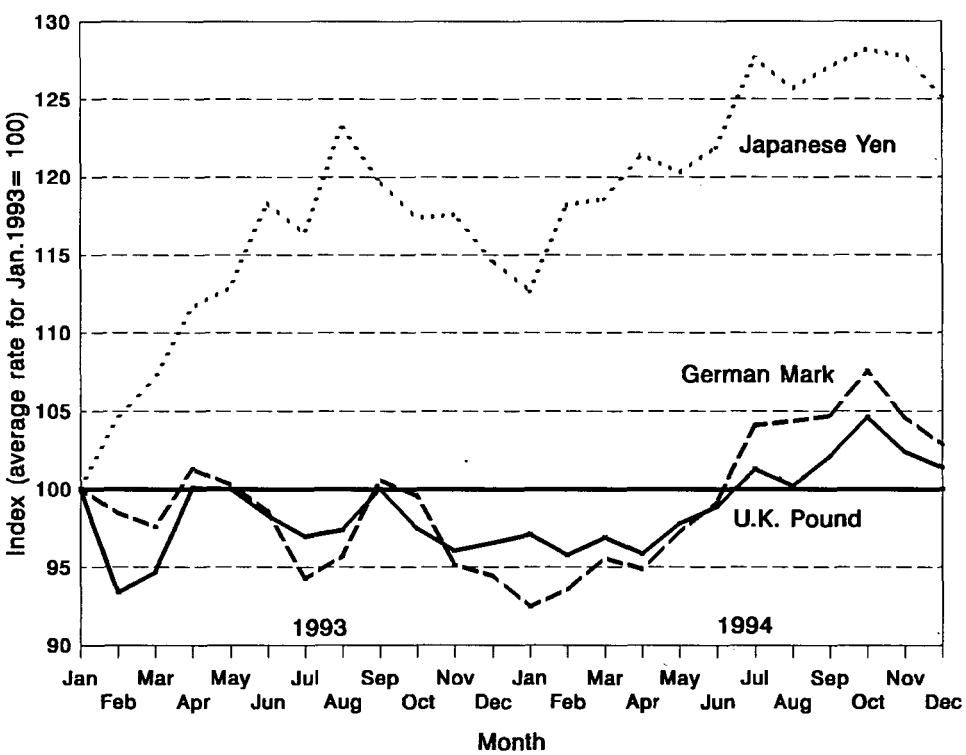
1.12 Short-term interest rates, which reflect the stance of monetary policy, generally continued to decline slightly in 1994 in the industrialized countries. However, in North America, these rates began to rise. After falling in 1993, long-term rates generally increased in 1994 probably due in part to expectations of a possible future increase in inflation. Despite this, interest rates were quite low which was a favourable factor for the cost of borrowing for the aviation industry.

1.13 Currency exchange rates during the year responded to international differences in interest rates and inflation rates, and to trade balances and various speculative pressures in individual countries. Among the major currencies, the Japanese yen continued to rise against

the United States dollar in 1994, although at a slower rate than in 1993 (Figure 1-2). The German mark and British pound also rose against the dollar although the average increase for 1994 over 1993 was quite small (and smaller than the increase during 1994).

1.14 Movements in exchange rates affect relative prices of international travel markets and hence the distribution of traffic flows. For example, the appreciation of the yen against the United States dollar tends to reduce prices of air tickets and accommodation for Japanese residents travelling to the United States and, therefore, to encourage demand in this market, and to have the reverse effect on travel to Japan by residents of the United States.

1.15 Movements in exchange rates can also affect the profitability and balance sheet of airlines. If the proportion of an airline's expenses incurred in the local currency exceeds the proportion of its local currency revenues, then appreciation of the local currency would tend to reduce the airline's operating profit. On the other hand, there could be a profit associated with that part of its debt denominated in a depreciated foreign currency.

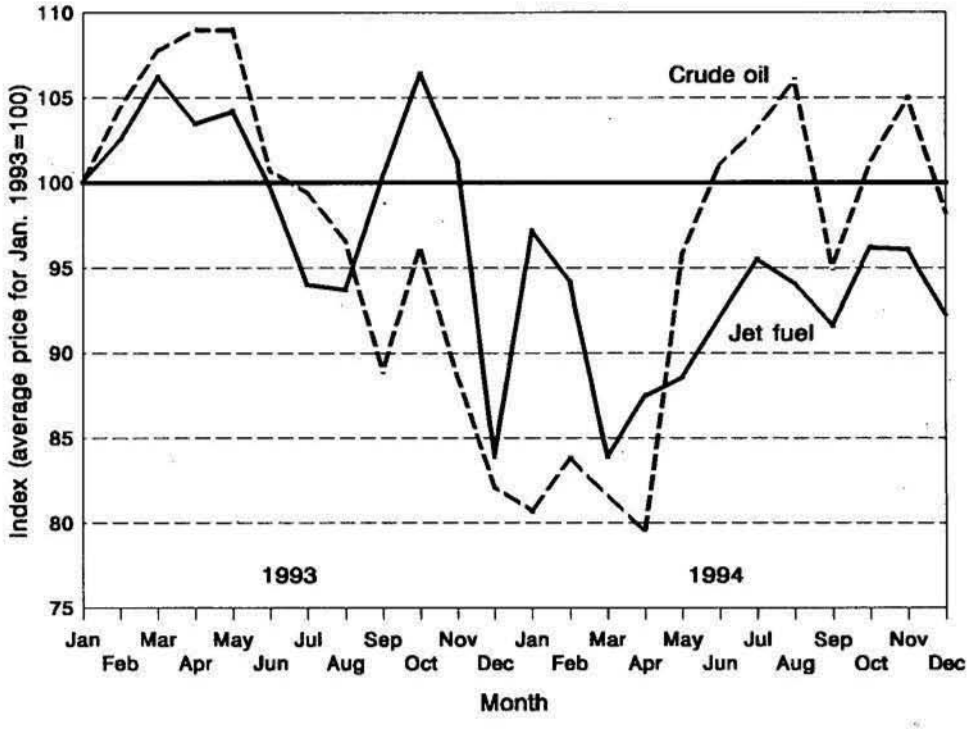


Source: IATA five-day rates.

Figure 1-2. Currency variations with respect to the U.S. dollar
(January 1993 to December 1994)

CRUDE OIL AND FUEL

1.16 As in the previous year, fuel markets experienced short-term volatility in 1994 (Figure 1-3). In terms of yearly averages, crude oil and jet fuel prices in 1994 were below those of 1993. There were significant price increases following historic lows reached around March and April 1994. On average, however, relatively low jet fuel prices helped to contain airline costs in 1994.



Source: Petroleum Economist and the Journal of Commerce.

Figure 1-3. Trends in crude oil and jet fuel prices
(January 1993 to December 1994)

Chapter 2
Air Carriers and their Fleets

2.1 This chapter reviews developments in 1994 regarding the economic regulation of air carriers; market entry and exit by air carriers; air carrier ownership, alliances and co-operative ventures; the service levels and the fares and rates they offer; the distribution of their products; their traffic, their fleets and their finances. Some information on developments in general aviation activities in 1994 is also included.

ECONOMIC REGULATION

Trade agreements

2.2 1994 marked the formal completion of the Uruguay Round of trade negotiations with the signing of the Final Act by 111 parties in Marrakech, Morocco on 15 April 1994 and the decision on 6 December that the entry into force of the new trade agreements and the establishment of the new World Trade Organization (WTO-OMC) to oversee them would be 1 January 1995. The WTO-OMC, which began with 81 Members, serves as the single institutional framework for the GATT as well as for all the agreements of the Uruguay Round, including the General Agreement on Trade in Services (GATS). The GATS includes an Annex on Air Transport Services. Through this Annex, the GATS excludes coverage of traffic rights but applies to three air transport services (aircraft repair and maintenance, selling and marketing of air transport, and computer reservation systems — CRS). In the negotiation of the GATS, parties were allowed to file exemptions from the most-favoured-nation treatment required by Article II of the Agreement and were urged to file specific commitments to market access and national treatment for specific services (least developed States had until 15 April 1995 to file exemptions and specific commitments). Twenty-five Members filed exemptions for one or more of the three services listed in the GATS Annex on Air Transport Services as follows: 3 for maintenance and repair; 24 for selling and marketing; and 23 for computer reservation systems. Forty-three Members made unrestricted specific commitments for market access and/or national treatment for one or more of the four modes of supply or means by which a service is provided as follows: 38 for repair and maintenance; 33 for computer reservation systems, and 32 for selling and marketing. Among the short-term implications of the inclusion of three air transport services in the GATS are how the regime will function between WTO-OMC Member and non-member States and how different regulatory regimes which apply to the same subject (such as the ICAO Code of Conduct on CRS and the GATS obligations for CRS) will operate. Long-term implications will depend on whether the GATS coverage of air transport services will be extended beyond the three presently covered. In that regard, the Annex on Air Transport Services in the GATS is to be reviewed within 5 years.

Air transport agreements

2.3 In 1994 States continued to expand international air services using new and amended bilateral air service agreements and memoranda of understanding. In comparison to 1993, however, there was a significant decline in the number of new bilateral agreements with a total of 47 reported during the year. Twenty-six of these agreements were inter-regional (between countries in different ICAO regions) involving primarily long-haul air services; while twenty-one were between countries within the same ICAO region, generally involving shorter flight stages. Almost three-quarters of the agreements were first-time accords, most involving new States; the remainder replaced existing agreements. The 6 memoranda of understanding and 21 amendments to bilateral air service agreements reported during 1994 dealt primarily with capacity arrangements, route expansion and additional airline designations.

2.4 The pace of liberalization of air services tended to be uneven. For example, after several efforts over a number of years to redefine their aviation relationship, Canada and the United States announced in December 1994 the conclusion of a framework agreement to progressively liberalize air services between the two countries, the details of which would be finalized early in 1995. In contrast, other bilateral negotiations between major traffic-generating States failed to show any progress and, after an ambitious beginning, the implementation of the final elements for the creation of a single aviation market between Australia and New Zealand was postponed. In late 1994, the Canadian Government also announced a new international aviation policy which included a "use or lose" criterion for rights by Canadian air carriers and an offer to authorize, in the absence of a bilateral air service agreement, limited scheduled service from countries which are not served by Canadian carriers. In February, Israel announced a new policy aimed at a more competitive environment by allowing foreign carriers more flexibility to increase capacity and by eliminating the requirement for prior approval of air fares.

2.5 In the area of reassessments of liberalized aviation regimes, the European Community's "Committee of Wisemen" early in 1994 issued a wide-ranging and comprehensive report containing both general and specific recommendations aimed at making European airlines more competitive, making the single community market function more effectively, and quickly establishing a Community approach to external aviation relations. In responding to the report of the "Committee of Wisemen", the European Commission developed an action programme containing a package of measures intended to fully implement the "Third Package" of liberalization measures and improve infrastructure. In its consideration of the action plan, the Council of Ministers stressed the importance of free and fair competition, recognized the need to reduce air carrier costs by improving the efficiency of infrastructure, requested the Commission to provide more extensive guidelines on state aids (which in the future should be exceptional), and indicated that ground-handling services should be non-discriminatory, transparent and cost efficient.

2.6 In separate action, the European Union continued to implement the "Third Package", the final of three phases of air transport liberalization measures designed to create a single market in air services within the Community through decisions on specific cases and general guidelines. The Commission adopted guidelines on state aids effective from 10 December 1994, initiated a study of its code of conduct on slot allocation at Community airports which was

adopted in 1993, and developed a draft directive for presentation to the Council of Ministers designed to liberalize ground-handling services at Community airports. Late in 1994, the Commission prepared a draft directive on negotiations with eastern European countries which would be presented to the Council early in 1995.

2.7 In the United States, the 1993 Report of the National Commission to Ensure a Strong Competitive Airline Industry was the basis for a government "Aviation Initiative" in early 1994 which, *inter alia*, established a strategy for negotiating future international aviation agreements aimed at actively seeking unrestricted, multilateral agreements; liberalizing existing bilateral agreements; vigorously defending existing bilateral rights; exploring the formation of a global coalition of like-minded, free market-oriented nations which could exchange new air rights and services for comparable benefits for carriers and citizens of the United States; and liberalizing current restrictions on foreign ownership of United States airlines. In November 1994, this strategy was formalized in greater detail in a new international aviation policy statement which also included two interim measures, transitional agreements for the phased removal of restrictions and liberalization of the air service market, and sectoral agreements which would eliminate restrictions on specific types of air services, such as all-cargo or non-scheduled.

2.8 The Commission of the Cartagena Agreement, in actions to strengthen and intensify sub-regional air transport in the Andean Pact, amended an earlier Commission decision in order to align its previous definitions of scheduled and non-scheduled air services more closely with those used by ICAO and issued a decision harmonizing the documentary requirements for authorizing air services by Andean Pact airlines within the sub-region. In addition to strengthening sub-regional air transport, the Andean Pact identified several other priorities, including negotiations with other countries in Latin America and the Caribbean; maintaining the principle of bilateralism in negotiations with other countries; developing legal measures which national authorities could use to prevent unfair competition and to avoid price dumping, predatory pricing, and excessively high prices from a lack of competition; and establishing mechanisms to avoid an oversupply of capacity by airlines from outside the sub-region.

2.9 The United Nations Economic Commission for Africa (ECA) continued efforts to deal with air service matters on a regional basis. For example, the African States signatory to the Yamoussoukro Declaration of 1988, a policy framework for the development of air transport in Africa, adopted a number of revisions to the Declaration aimed at improving its implementation, rescheduling its objectives of co-operation and integration of African air transport, though with a more flexible timetable of activities, and possibly turning the Declaration into a more formal agreement.

2.10 Also during the year national postal administrations continued their efforts to increase their competitiveness against independent air express and courier services. At the 21st Congress of the Universal Postal Union (UPU) a common strategy was approved by the postal administrations to safeguard and enhance the quality of the international postal service during the 1995-1999 period. This was complemented by actions at the national level such as in China, France and Denmark. Also in 1994, some governments (Germany, the Kingdom of the Netherlands, Switzerland, United Kingdom) initiated or implemented the privatization of part or all of their national postal services. In the United States, after an 18-month dispute on rates, the Postal Service issued new mail contracts which were expected to cut airline revenue from

mail transportation by about 11 per cent. In the new contracts air mail volumes are dependent on the on-time performance of the bidding airline. In another development, a United States court ordered the Postal Service to discontinue a new international service which offered special rates for selected customers to win business away from private sector competitors.

ICAO World-wide Air Transport Conference

2.11 ICAO's World-wide Air Transport Conference was convened in Montreal from 23 November to 6 December 1994 to examine "International Air Transport Regulation: Present and Future". The Conference, attended by representatives from 138 countries and 27 international organizations, provided a unique opportunity to undertake a comprehensive examination of the economic regulation of international air transport which is going through a dynamic period of change as a consequence of increasing competition, transnationalization of business, globalization of the world economy and the emergence of regional economic groupings, privatization and liberalization of service industries, and the introduction of new global trading arrangements for service sectors. The agenda encompassed a brief review of present regulation, an exploration of proposed arrangements for the future regulation of international air transport and implications for its process and structure. At the end of its deliberations the Conference adopted a single comprehensive recommendation directed in part to States and in part to ICAO.

2.12 With respect to the present situation, the Conference recognized the contribution to international air transport of the principles in the Convention on International Civil Aviation of sovereignty, non-discrimination, interdependence, harmonization and co-operation at the global level as well as the contribution of the International Air Services Transit Agreement (the "two freedoms" agreement which provides overflight and non-commercial landing rights for scheduled air services). It noted that within the framework of the Convention, States have many differing regulatory goals and policies but share a fundamental objective of participation through reliable and sustained involvement in the international air transport system. The Conference recognized that bilateralism and multilateralism can and do co-exist and can each accommodate different approaches to international air transport regulation.

2.13 In terms of future regulatory arrangements, the Conference envisioned that any change in approach would need to take into account a number of principles and factors, including but not limited to the broader economic and social benefits of air transport, infrastructure constraints and environmental considerations, the reality of disparities amongst States, the need for appropriate training, and the interests of all stakeholders in international air transport. The Conference emphasized that regulatory change towards a more liberalized, competitive air transport environment should be gradual, progressive and evolutionary with adequate safeguard mechanisms to ensure effective and sustained participation by all States in international air transport. The interests and needs of developing countries would require special consideration.

2.14 The Conference recommended that States give due consideration in their regulatory responsibilities and their bilateral and multilateral air transport relations to its conclusions both on a number of specific regulatory arrangements dealing with air carrier operations and on more general regulatory topics having an impact on international air transport.

2.15 With respect to specific regulatory arrangements, States should consider broadening the criteria applied to air carrier ownership and control for the use of market access to include one or more States parties to an agreement or their nationals as well as an air carrier owned and controlled by nationals or by one or more other States which were part of a pre-defined group with a "community of interest". The Conference proposed greater flexibility for air carriers in their choice of ground-handling arrangements, as well as recognition that air carriers have a right to convert and remit abroad to a carrier's choice of State local revenues in excess of sums locally disbursed and to station certain categories of their personnel in stations abroad. In the areas of selling and marketing their services, the Conference concluded that States should agree to accord each designed air carrier "national treatment" including the right to establish offices both on-line and off-line. With respect to computer reservation systems, States should use as their basis for regulation The ICAO Code of Conduct for the Regulation and Operation of Computer Reservation Systems.

2.16 In the area of more general regulatory topics, the Conference noted that the question of State aids/subsidies was very complex and although they were not unfair *per se*, some had the potential of being so. In such cases States should take action to ensure that state aids/subsidies have no adverse impact on competing air carriers. Existing procedures for slot allocation at congested airports appeared adequate; the longer-term solution lay in increasing airport capacity. Where antitrust or competition laws apply to co-operative arrangements, the Conference concluded that appropriate immunity and exemption should be made available to permit inter-carrier co-operation, including tariff co-ordination, to continue where they benefit users and air carriers. The Conference emphasized ICAO's role as the global forum for developing environmental Standards and Recommended Practices. With respect to taxes, the Conference view was that States should undertake to reduce to the fullest extent, and make plans to eliminate as soon as its economic conditions permit, all forms of taxation on the sale or use of international air transport by air.

2.17 The Conference recommended a number of actions by ICAO, including that it exert a leadership role in the development of economic regulation of international civil aviation, develop effective communication and co-operation with the new World Trade Organization, attach a high priority to addressing environmental issues related to international civil aviation and continue to promote appropriate training. With regard to further work to facilitate the evolution of the regulatory environment, the Conference proposed the following topics for further study and development of recommendations by ICAO, some of which would involve new areas of work while others called for the refinement of proposals which had been considered by the Conference: development and refinement of the safeguard and "safety net" arrangements presented to the Conference as part of a package of ideas on broader market access; broader air carrier ownership and control criteria; the implications of code-sharing for international air transport regulation; development of a model CRS clause for use in bilateral air service agreements or multilateral arrangements; development of more formalized structures for regulatory arrangements on "doing business" matters; possible development into more formalized structures of some regulatory arrangements on "hard rights" (traffic and route rights, designations); an analytical model for evaluating net national benefits of international air transport and, to the extent possible, of associated regulatory approaches; and preferential measures in the economic regulation of international air transport to ensure the effective participation of developing countries in such transport.

2.18 As to the future regulatory process and structure of international air transport regulation, the Conference foresaw no prospect in the near future for a global multilateral agreement on the exchange of traffic rights. Nevertheless, it noted that liberalized arrangements at the sub-regional or regional levels can provide valuable experience to other States. Finally, in the evolution of regulation, the Conference emphasized the importance of the primacy principle — that existing rights should be respected — although this does not preclude changing such rights where the parties concerned agree.

MARKET ENTRY AND EXIT

New and Discontinued Carriers

2.19 The number of airlines in the world in operation with at least one aircraft with a maximum take-off mass not less than 9 tonnes (20 000 lbs) was estimated at about 1 400 at the end of 1994. During the year nearly 120 air carriers were reported to have started operations and a further 200 to have been constituted but, by the end of the year, to have yet to commence operations. Some 90 air carriers went out of business including about a dozen that had never commenced operations. A significant part of these developments related to the CIS, where some 20 new air carriers were established while a similar number went out of business. In the Russian Federation, the largest territory in the CIS, by year end there were 413 carriers of which about 150 were authorized to operate internationally. Many of these carriers are not yet fully operational and, together with expectations of mergers, the number of air carriers in the Russian Federation is likely to be significantly reduced in the near future.

2.20 The majority of the new entrants outside the CIS were small regional or domestic operators, their establishment in many cases fostered by changes in the regulatory environment and/or reduced start-up costs due to the availability of a trained workforce from airlines which had reduced their staff and lowered prices for used aircraft. About one-third of the new entrants which started operations in 1994 were from Europe (excluding the CIS) and more than one-fifth from Latin America/Caribbean. Of the new entrants which by year end had not started operations, more than 60 per cent were registered in Europe and North America and of these nearly half were in the United States.

2.21 Among the (non-CIS) new air carriers which were reported as becoming operational during 1994 some 20 per cent commenced international scheduled passenger services, about 25 per cent started international non-scheduled passenger services and some 33 per cent started domestic scheduled passenger services, the remainder being accounted for by all-freight operations. Among the newly-formed airlines which were slated to start operations after 1994, nearly 90 per cent intended to commence passenger services.

2.22 Among the airlines which ceased operations in 1994, there were many with just a few years or even months of operations, such as Ambassador Airways of the United Kingdom which had started non-scheduled operations in 1993, and some long-established names such as Linea Aeropostal Venezolana (LAV) formed in 1933, and the national airline of Zambia, Zambia

Airways, formed in 1967. About 40 per cent of the airlines which ceased to operate were registered in Latin America/Caribbean and more than a quarter were based in Europe.

2.23 On the basis of schedules published in multilateral airline schedule guides, it is estimated that at the end of 1994 there were some 710 air carriers world-wide providing scheduled passenger services (international and/or domestic) and about 90 operating scheduled all-freight services. About 75 per cent of all air carriers operating scheduled air services were from three regions: North America, Europe and Asia/Pacific. International scheduled passenger services were provided by some 380 carriers and about 60 carriers provided international scheduled all-freight services. Over 50 per cent of air carriers providing international scheduled services were from two regions: Europe and Latin America/Caribbean.

New and Discontinued Routes

2.24 During 1994 the world's airlines continued to restructure their networks. In September 1994 there were some 1 640 new direct (single passenger aircraft) airlinks between international city-pairs, while 1 116 links were eliminated as compared with September 1993, thus bringing about a net increase of 524 in the number of city-pairs with direct passenger air services. For the same 12-month period one year earlier there had been a net increase of 220 airlinks.

2.25 Nearly half of the new direct airlinks were established within two route groups: within Europe and within North America. The same two route groups also accounted for nearly half of the airlinks which were discontinued. Net decreases in the number of direct passenger airlinks were experienced on routes within North America; between and within Central America and the Caribbean; across the Mid Atlantic; between Europe/Middle East/Africa and Asia/Pacific; and across the Pacific.

OWNERSHIP, ALLIANCES AND CO-OPERATION

Privatization

2.26 The process of partial or full privatization of government-owned airlines continued in 1994 although additional privatization objectives were made known for only three (see Table 2-1). Malaysia Airlines completed its partial privatization process during the year when 32 per cent of its stake held by the government was sold to the Malaysia Helicopter Services. In Latin America and the Caribbean, the Chilean Government sold its final 23.8 per cent share of national carrier Lan Chile on the local stock exchange in May 1994, thus turning Lan Chile into a fully privatized company. Two other carriers in the region, Air Jamaica and LAPSA (Paraguay), after some delay, also achieved their privatization aim in 1994 (with 75 per cent and 80 per cent, respectively, in the hands of private shareholders). In Europe the German Government approved the privatization plan of Lufthansa in March 1994 and effectively gave up its majority shareholding when its 52 per cent share fell to 42 per cent after the airline's share issue in October.

Table 2-1. Government-owned airlines targeted for partial or full privatization

Targeted during 1994	Targeted prior to 1994 and still under preparation	Aim achieved during 1994
Finnair	Aeroflot (Russian Federation)	Air Jamaica
Kuwait Airways	Air France	Lan Chile
Vietnam Airlines	Air India	LAPSA (Paraguay)
	Air Lanka	Lufthansa (Germany)
	Alitalia	Malaysia Airlines
	Balkan Bulgarian Airlines	
	Bangladesh Biman Airlines	
	BWIA (Trinidad and Tobago)	
	CSA (Czech Republic)	
	Dominicana de Aviación	
	El Al (Israel)	
	Ghana Airways	
	Garuda Indonesia	
	Gulf Air	
	Hemus Air (Bulgaria)	
	Indian Airlines	
	Kenya Airways	
	LAB (Bolivia)	
	LIAT (owned by 11 Caribbean States)	
	LOT-Polish Airlines	
	Nigeria Airways	
	PLUNA (Uruguay)	
	Qantas (Australia)	
	Royal Jordanian Airlines	
	Royal Nepal Airlines	
	Solomon Airlines	
	Sudan Airways	
	TAP-Air Portugal	
	TAROM (Romania)	
	THY Turkish Airlines	
	Tunis Air	

2.27 Preparations for privatization continued during the year for some 31 government-owned carriers which had been targeted during the previous years (see Table 2-1). Among reported developments, the Australian Government continued to prepare for the privatization of its national carrier Qantas and planned to sell off its remaining 75 per cent stake on the local stock market in 1995. It was also reported that two Chinese carriers, China Eastern Airlines and China Southern Airlines, were preparing to list their shares in foreign stock exchange markets. Like the previous year, the privatization of several carriers had to be deferred or postponed because of economic conditions, the financial state of the airlines concerned or local circumstances.

2.28 In addition to airlines for which privatization information was available, listed in Table 2-1, some other airlines (including some listed in previous years) may also be at different stages of preparation for privatization.

National Consolidation

2.29 In 1994 no major airline consolidation was reported. Most mergers and takeovers at the national level took place between relatively small regional air carriers. Some proposed merger plans met with opposition from governments.

2.30 In the Lao People's Democratic Republic, Lao Aviation and Lao Aviation International were merged into the new Lao Aviation. Hong Kong-based Cathay Pacific Airways took control of Air Hong Kong when it bought a 75 per cent stake of the freight carrier. In Yemen, the stalled merger plan of Yemen Airways (Yemenia) and Alyemda Yemen Airlines was reactivated and approved by the government. In Europe, Alitalia absorbed its subsidiary Aerotrasporti Italiani (ATI) as part of its restructuring plan, and Scanair and Conair merged to form Premiair (Denmark).

2.31 In the United States, AirTrans acquired Conquest Sun Airlines, a Fort Lauderdale-based start-up airline; American International Airways bought MGM Grand Air; and Florida West Airlines completed its acquisition of the North Carolina-based cargo carrier Tradewinds International Airline.

2.32 Elsewhere, Lan Chile acquired full control of Fast Air, a Chilean freight carrier, but its application to merge with another major Chilean carrier, Ladeco, was turned down by the Chilean competition authorities. The plan to merge Air Martinique with Air Guadeloupe to create a new Caribbean airline was vetoed by Martinique's local authorities.

Transnational Ownership

2.33 The trend towards partial foreign ownership of airlines continued during 1994. Several States adopted new policies or amended existing rules on foreign investment in national carriers. The Chinese Government announced a new policy which allows up to 35 per cent foreign investment in its airlines. The Mexican Government also revised its foreign investment law to allow a maximum of 25 per cent foreign ownership in its airlines. Peru permitted increased foreign investment in its airlines. The United States Government, in its new international aviation policy, undertook to pursue, *inter alia*, legislation to further liberalize its foreign ownership rules.

2.34 During 1994 Lufthansa (Germany) took a 38 per cent stake in the regional carrier Business Air (United Kingdom) and separately purchased a further 13.3 per cent stake of Lauda Air (Austria), raising its total shareholding in Lauda Air to 39.7 per cent (26.4 per cent of which is owned by Lufthansa's charter subsidiary Condor). El Al (Israel) acquired a 48 per cent stake in StarLine, a subsidiary of Air Holland, and the multinational airline Air Afrique accepted a minor equity investment from a private source, DHL International (United States).

2.35 During the year, SAS (Scandinavia) increased its stake in British Midland from 34.9 per cent to 40 per cent. British Airways and Air India raised their share in Air Mauritius from 12.7 per cent to 13.2 per cent and from 8.5 per cent to 12 per cent, respectively. KLM (Netherlands) also increased its stake in Northwest Airlines (United States) from 20 per cent to 25 per cent, while Iberia's (Spain) stake in Aerolineas Argentinas went up from 45 per cent to 85 per cent. Conversely, Japan Airlines, while still maintaining a commercial partnership, sold its 5 per cent shareholding in Air New Zealand to the carrier's major New Zealand shareholder. SAS also sold its 42 per cent stake in Lan Chile. Air France sold its 19.1 per cent stake in CSA (Czech Republic) to the Czech Konsolidacni Bank and was considering selling its 37.5 per cent share in Sabena (Belgium).

2.36 1994 saw the establishment of a number of joint venture airlines in various regions of the world, often involving foreign equity investment.

2.37 In Africa, the governments and airlines of South Africa, Uganda and the United Republic of Tanzania decided to jointly form a new long-haul carrier named Alliance (or African Joint Air Services) to operate intercontinental services to such cities as London, Dubai and Bombay. Five governments in the Caribbean region founded a new regional carrier, Carib Express, with the assistance of British Airways. States belonging to the Economic Co-operation Organization (ECO), a regional trade group comprising Afghanistan, Islamic Republic of Iran, Pakistan, Turkey and six former Soviet Republics signed an agreement to set up a new joint venture airline, ECO Air.

2.38 In Asia, Air Macau was formally established as a joint venture airline with China-controlled Companhia de Serviços de Aviação de Macau holding 51 per cent shares and the Government of Macau, TAP Air Portugal and private investors holding the balance. Air Mandalay was established in Myanmar as a joint venture between Myanmar Airways and Air Mandalay Holdings Pte. Ltd. of Singapore. Air Maldives commenced international operations as a joint venture airline with the government holding 60 per cent of the shares and Malaysia Helicopter Services the balance. The latter also launched a similar joint venture with the Government of Cambodia with regard to Royal Air Cambodge. Four ASEAN governments, Malaysia, Brunei Darussalam, the Philippines and Indonesia, were studying the feasibility of setting up a jointly owned and run low-cost airline. Singapore Airlines and Tata Industries Ltd. of India agreed to set up a joint venture domestic airline in India.

2.39 In Europe, SAS and the Latvian Government agreed to form an international airline for Latvia. Regional Lineas Aereas was created as a joint venture between Regional Airlines (France) and Gestair (Spain) to operate services connecting Madrid with points in Spain, Portugal and North Africa.

2.40 As a reflection of this trend of transnational ownership, of the top 30 scheduled airlines in the world (in terms of international scheduled traffic carried in 1994, see Table 2-7), 20 now hold equity in a foreign airline and 10 have equity held by foreign airline(s).

Transnational Alliances

2.41 Throughout 1994, world airlines continued to redefine their market presence, many by forging alliances through various forms of co-operative arrangements such as code-sharing, blocked space, joint marketing and purchasing.

2.42 During the year, many airlines took further steps to consolidate, improve or expand their existing co-operative partnerships, such as those of United Airlines (United States) separately with Air Canada and Thai Airways International; KLM with Northwest Airlines; Air Canada with Air France; and British Airways with USAir. Delta Air Lines (United States), Singapore Airlines and Swissair also strengthened their ties by setting up a joint purchasing venture.

2.43 Numerous new co-operative arrangements were concluded during 1994. While some arrangements were wide-ranging strategic alliances covering a host of commercial and operational activities such as code-sharing, joint ground handling, co-ordination of schedules, frequent flyer programme co-operation and joint maintenance, others were more targeted agreements that focused on specific routes or fields of co-operation.

2.44 Among the new strategic alliance arrangements concluded in 1994 were those by American Airlines with Canadian Airlines International, Alitalia with Continental (United States), KLM with Garuda Indonesia, Lufthansa with Thai Airways International, British Airways with Qantas (Australia), Ansett Australia with Singapore Airlines and Virgin Atlantic (United Kingdom), and Taesa (Mexico) with Transavia Airlines (Netherlands). Some of these alliances were made with a broader aim of creating a major global airline network, for example those formed by KLM, Northwest and Garuda Indonesia; British Airways, Qantas and USAir; Air Canada, Continental and Air France; United Airlines, Lufthansa and Thai Airways International.

2.45 Carriers in the United States continued to expand their co-operative ties with carriers of other States, such as American Airlines with Gulf Air and with LOT (Poland); United Airlines with Cayman Airways and National Airlines (Chile); Northwest Airlines with Asiana Airlines (Republic of Korea) and Air UK; USAir with Mexicana, and Air L.A. with Mexicana. Delta Air Lines also strengthened its ties with Aeromexico, Malev (Hungary) and Sabena through code-sharing arrangements and concluded co-operative agreements separately with All Nippon Airways, Austrian Airlines, Varig (Brazil), Vietnam Airlines, BWIA (Trinidad and Tobago) and Korean Air.

2.46 Inter-regional co-operative agreements were concluded by All Nippon Airways with Air Canada; Ansett Australia with Virgin Atlantic; Iberia with Aerolineas Argentinas; Japan Airlines with Aeromexico and Air France; Air Littoral (France) with Emirates; and by Air New Zealand with SAS and Lan Chile. Malaysia Airlines, Malaysian Helicopter Services and World Airways (United States) entered into a tripartite agreement to operate freighter services between Malaysia and Europe/United States.

2.47 Carriers in the Asia/Pacific region also concluded a number of intra-regional co-operative arrangements. Qantas and Air New Zealand extended their trans-Tasman co-operation arrangement. Code-sharing arrangements were made between Ansett Australia and

Malaysia Airlines, and by Air Niuguini with Philippine Airlines and Solomon Islands Airways. Four Asian airlines, Cathay Pacific, Garuda Indonesia, Singapore Airlines and Thai Airways International, agreed to form a South-East Asian Maintenance Alliance (SEAMA) aimed at reducing costs by pooling their aircraft, engines and component maintenance. A co-operative agreement for the maintenance of the Boeing 777 was reached between Japan Airlines and All Nippon Airways.

2.48 In Europe, several intra-regional co-operative arrangements were signed including those by Alitalia and British Midland; Iberia separately with Austrian Airlines, Finnair, Lufthansa and TAP Air Portugal; Austrian Airlines separately with British Midland, Malev and LOT; and Lufthansa separately with Finnair, Lauda Air, Air Dolomiti (Italy) and Transwede. Some European airlines continued in their efforts to establish a series of regional feeder networks, sometimes on the basis of franchises, such as between Proteus (France) and Air UK; and between Loganair (United Kingdom) and British Airways. British Airways also concluded a franchising agreement with GB Airways, thus bringing the number of franchised partners to six.

2.49 Elsewhere, Air Afrique and Gambia Airways established a co-operative partnership through a code-sharing and blocked space arrangement. Air Mauritius and Cathay Pacific Airways concluded an agreement to operate joint services between their home territories. Air Mauritius also signed an agreement with Lufthansa involving both commercial co-operation and maintenance support. In Latin America, code-sharing arrangements were concluded, among others, by Aerolineas Argentinas with Viasa (Venezuela); Aeromexico with Aero Peru; and LAB (Bolivia) with Varig (Brazil). Aero Peru and Viasa, and SAETA (Ecuador) and LAPSA (Paraguay) also concluded commercial co-operative agreements.

2.50 Code-sharing arrangements, as a form of airline alliance, have proliferated in recent years and in 1994 the number of such agreements grew considerably. About 90 new agreements were reported to have been signed involving 82 different airlines (including many cited above) covering potential services between approximately 2 500 city pairs in addition to over 100 such agreements which had been concluded prior to 1994.

2.51 Code-sharing has not only evoked considerable interest from airlines, but also drew growing attention from governments because of its regulatory implications affecting market access, competition and consumer protection. During 1994, several studies were initiated by national and regional regulatory authorities and one was completed by year end. The ICAO World-wide Air Transport Conference also considered the issue and recommended that ICAO undertake a study on the implications of code-sharing arrangements for international air transport.

SERVICE LEVELS

2.52 During 1994, there were signs of recovery in the premium travel market. A number of major airlines continued to make adjustments to the level of cabin services offered by

eliminating first class and creating an enhanced business class. In the United States, some airlines expanded (American Airlines, United Airlines) or introduced (USAir) a new business class service.

2.53 During the year airlines continued to add new amenities, with particular emphasis on business class. Improvements included wider seats with greater leg room; introduction of faster check-in procedures, including new check-in facilities at train stations and hotels; check-in by phone for passengers with hand luggage only; better lounge facilities at airports; and such innovations as an in-flight tailoring service with passenger measurements being sent by facsimile to the destination.

2.54 Some major international airlines ordered or installed fully interactive in-seat entertainment and communications systems during the year. Airlines also continued to install multichannel satellite communication systems with digital voice transmission, enabling, *inter alia*, air-to-ground telephone services and facsimile transmission, notably in North America and in Europe. On 24 February, the first ever in-flight live television transmission to a commercial airliner, a Swissair MD-11 flying across Siberia, was successfully demonstrated.

2.55 In 1994 interactive gambling in-flight received some attention as a potential new source of revenue for the airlines. However, the first international airline to introduce in-flight gambling during the year had to postpone it due to technical and legal problems. The United States adopted legislation which bars any national or foreign airline from offering gambling when serving airports in that country.

2.56 A number of new Frequent Flyer Programmes (FFP) were launched during the year. These included a joint programme named Latinpass formed by 12 international carriers from Latin America, with USAir as their partner in the United States; a joint Air India/Indian Airlines programme; and individual FFPs by Air China, Jet Airways (India), Taesa (Mexico), South African Airways and Vietnam Airlines. In an effort to increase the attractiveness of FFPs, more airlines linked their individual programmes with those of other carriers. For example, Qantas (Australia) joined its FFP with those of American Airlines, British Airways, Canadian Airlines International, SAS (Scandinavia) and USAir; and Austrian Airlines, British Airways, Cathay Pacific, Malaysia Airlines, Singapore Airlines and Swissair joined Programme A, an FFP for residents of Japan launched by All Nippon Airways.

2.57 However, the proliferation of FFPs, their high management costs and revenue dilution, associated with the potential loss of revenue earning seats on the most popular flights, led some airlines to attach more restrictions and conditions to their FFPs. In the United States, where the first FFPs were introduced in 1981, most carriers announced that in 1995 more miles would have to be accumulated in order to earn free travel. In 1994 the United States Supreme Court ruled that travellers could sue airlines for the retroactive implementation of restrictions in frequent flyer benefits, a decision which was expected to have implications for the future of FFPs. Also in the United States, fifteen major corporations established a company called Business Travel Contractors Corp. (BTCC) which proposes to avoid frequent flyer awards and travel agent commissions in exchange for lower "net" air fares for members of the group.

FARES AND RATES

Tariff Levels

2.58 Changes in the average levels of international economy class normal (i.e. unrestricted) fares and under-45 kilogram general cargo rates world-wide and in various geographical areas, between September 1993 and September 1994 and over the period 1985-1994, are shown in Tables 2-2 and 2-3.

2.59 From Table 2-2 it may be seen that normal economy class fares, as expressed in United States dollars, increased by an average of 5 per cent world-wide between September 1993 and September 1994, with changes for individual route groups ranging from an average decrease of 7 per cent for routes across the South Atlantic to an average increase of 10 per cent for routes in local Middle East. These changes reflect both changes in fares in local selling currencies and changes in the bankers' exchange rates between these currencies and the United States dollar. Calculated on the basis of selling currencies, average international fares also increased by 5 per cent world-wide, with variations for individual route groups ranging from an average decrease of 9 per cent for routes across the South Atlantic to an increase of 22 per cent in local Africa. The relatively high average increases in the normal economy fares for routes involving Africa and the Middle East are due to the significant devaluation of a number of local selling currencies in these two regions between 1993 and 1994. With some exceptions, the trends in normal economy fares appear to reflect trends in fares generally.

2.60 The long-term trend in fare levels is shown by comparing the fares for September 1985 with those for September 1994 (last column in Table 2-2), expressed in constant U.S. dollars, in order to have a measure of the real change. Over the period concerned the average economy class normal fare for the world increased in real terms at an average of 2 per cent per annum. On a route group basis, average annual changes ranged from a decrease of some 2 per cent for routes within the Middle East to an increase of about 6 per cent for those within Europe. It should be noted that these figures are influenced by the relationship of the U.S. dollar with the other currencies over the same period.

2.61 With respect to cargo rates, as will be seen from Table 2-3, the average rate for shipments under 45 kg increased world-wide by 3 per cent between September 1993 and September 1994 when expressed in U.S. dollars; however, in terms of selling currencies, it increased on average by 5 per cent. The long-term trend in cargo rates shows that between September 1985 and September 1994, the average general cargo rate for shipments under 45 kg has, in general, been decreasing in real terms for almost all areas of the world.

Tariff Establishment

2.62 In 1994, there were no new developments on the status of the European Commission's conditional "block exemption" for inter-airline tariff consultations from certain aspects of European Community competition law requirements; this exemption allows such activities to take place within IATA, provided they are aimed at facilitating interlining. With respect to the

antitrust immunity for tariff co-ordination activities as far as the United States was concerned, the IATA multilateral tariff negotiation process continued to function against the background of uncertainty as IATA's submission to the United States authorities in 1990 for approval of the current provisions for the conduct of IATA's Traffic Conferences remained under consideration.

2.63 Meanwhile, IATA continued to adjust its tariff co-ordination process and structure to adapt to the changing operating environment. In the case of passenger tariffs, IATA made changes to the fare construction rules so as to apply the pricing unit concept as the industry standard in calculating certain discount fares for international journeys (i.e. permitting CRS fare quotation programmes to split a journey with many segments into several pricing units, as if selling separate tickets, and then combine them to see whether a lower fare can be obtained). Work continued on studying possible solutions for adoption of the same concept for normal fares. Some progress was also made in establishing standard rules for passenger baggage allowances and charges. Although unable to achieve a single common baggage system, IATA reached agreement on rules for two separate systems, namely the "weight system" and the "piece system", the latter of which had not had an industry standard since 1989.

2.64 In the case of cargo, although IATA had been unable in several previous attempts to achieve revenue improvement by an "across-the-board" surcharge or increase, it succeeded during the year in reaching agreements for rate increases in varying degrees on an area/route basis according to local circumstances and market conditions. Also, in an effort to deal with the industry cargo tariff problems such as the complexity of the structure and wide discrepancy between published rates and market rates, IATA developed some recommendations to reform the existing process and structure for further consideration in early 1995.

PRODUCT DISTRIBUTION

2.65 In 1994 there was a tendency towards increasing the concentration in the industry of and expansion of the existing major computer reservation systems (CRS). The Amadeus CRS (owned by Air France, Lufthansa and Iberia) signed an agreement of intent to acquire the System One CRS owned by Continental Airlines and operated by Electronic Data Systems (EDS). After a lengthy disagreement, Air Canada and Canadian Airlines agreed in February to dissolve their partnership in the Gemini system; Canadian being hosted in the SABRE system and Air Canada forming a CRS system with Galileo International, to be known as Galileo Canada. Major multinational CRS vendors expanded their systems in terms of the number of participating air carriers, countries served, terminals, agencies, enhanced functionalities, and other tourist-related services. According to a survey of major vendors, one or more multinational CRS vendors were present in 70 per cent of ICAO's 183 Contracting States and approximately 45 per cent of ICAO Contracting States had operations by more than one multinational CRS vendor.

Table 2-2. Comparison of average economy class normal fares by route group at average city-pair distance

Route group	Average city-pair distance (1994) (km)	Average economy class normal fare			Percentage change 1994/1993		Average annual percentage change 1994/1985 (in fares expressed in constant U.S.$)
		Sept. 1985 (U.S.$)	Sept. 1993 (U.S.$)	Sept. 1994 (U.S.$)	(in fares expressed in U.S.$)	(in fares expressed in selling currencies)	
I. International average — world	3 300	458	694	726	5	5	2
II. International route groups:							
1. Between North America and Central America/Caribbean	2 200	275	431	445	3	3	2
2. Between and within Central America and the Caribbean	600	137	176	174	–1	–2	–1
3. Between Canada, Mexico and the United States	1 900	211	364	386	6	7	4
4. Between North America/ Central America/Caribbean and South America	4 000	517	657	654	0	0	–1
5. Local South America	2 000	271	340	347	2	2	–1
6. Local Europe	1 200	241	459	500	9	3	6
7. Local Middle East	1 400	256	288	315	10	21	–2
8. Local Africa	1 700	233	348	336	–3	22	1
9. Between Europe and Middle East	3 300	560	804	831	3	4	1
10. Between Europe/Middle East and Africa	5 300	708	1 064	1 100	3	11	2
11. North Atlantic	7 300	820	1 273	1 333	5	3	2
12. Mid Atlantic	8 200	943	1 428	1 463	2	–1	2
13. South Atlantic	10 300	1 147	1 765	1 647	–7	–9	1
14. Local Asia/Pacific	3 000	366	533	560	5	5	2
15. Between Europe/Middle East/ Africa and Asia/Pacific	7 300	837	1 179	1 224	4	3	1
16. North and Mid Pacific	11 000	973	1 302	1 317	1	4	0
17. South Pacific	8 300	1 006	1 448	1 485	3	–1	1

Source: ICAO Surveys of International Air Transport Fares and Rates.

Table 2-3. Comparison of average general cargo rates under 45 kilograms by route group at average city-pair distance

Route group	Average city-pair distance (1994) (km)	Average under-45 kg general cargo rate per kilogram			Percentage change 1994/1993		Average annual percentage change 1994/1985 (in rates expressed in constant U.S.$)
		Sept. 1985 (U.S.$)	Sept. 1993 (U.S.$)	Sept. 1994 (U.S.$)	(in rates expressed in constant U.S.$)	(in rates expressed in selling currencies)	
I. International average — world	5 400	5.22	6.34	6.55	3	5	–1
II. International route groups:							
1. Between North America and Central America/Caribbean	2 400	2.42	2.86	2.59	–9	–9	–4
2. Between and within Central America and the Caribbean	600	1.14	1.59	1.57	–1	–1	0
3. Between Canada, Mexico and the United States	2 300	1.47	1.79	1.78	0	1	–2
4. Between North America/ Central America/Caribbean and South America	5 500	5.06	5.71	5.74	1	1	–3
5. Local South America	2 800	3.63	3.38	3.42	1	1	–6
6. Local Europe	1 400	2.05	2.75	2.91	6	1	0
7. Local Middle East	1 300	1.80	2.03	1.93	–5	9	–4
8. Local Africa	2 000	2.08	2.91	2.94	1	35	0
9. Between Europe and Middle East	3 800	4.63	5.72	5.73	0	1	–2
10. Between Europe/Middle East and Africa	5 700	5.29	7.42	7.74	4	12	1
11. North Atlantic	7 400	6.56	7.28	7.68	5	3	–3
12. Mid Atlantic	8 000	9.03	10.38	10.69	3	2	–2
13. South Atlantic	9 700	10.34	12.55	12.95	3	2	–2
14. Local Asia/Pacific	3 800	3.21	4.53	4.88	8	6	1
15. Between Europe/Middle East/ Africa and Asia/Pacific	7 800	7.33	8.42	8.65	3	2	–2
16. North and Mid Pacific	11 700	8.76	10.16	10.44	3	5	–2
17. South Pacific	9 600	7.63	9.28	9.86	6	3	–1

Source: ICAO Surveys of International Air Transport Fares and Rates.

2.66 Several major CRS systems developed special programmes that provided access via individual personal computers as well as programmes that were compatible with widely available software. The initial popularity of new methods of accessing information on air carrier services indicates that in the future a growing proportion of air travel will be booked and sold using such methods.

2.67 Several airlines initiated "ticketless" travel on certain services, using credit cards or special cards capable of being scanned by machines at check-in or gate positions. Philippine Airlines, in co-operation with a local bank, introduced its version of ticketless travel whereby passengers pay for their fares at automatic bank teller machines with the receipt being accepted instead of a regular ticket at check-in. With airlines focusing on ticketless travel, the expansion of electronic ticket distribution networks (ETDN) slowed, and by October only two ETDN companies were operational, issuing about 21 000 tickets monthly in their 400 locations. The endorsement by the Airlines Reporting Corp. of linking individual ETDN contractor's networks, however, removed a technical obstacle to the creation of a country-wide ETDN network in the United States. The interest in ticketless travel raised doubts about the advisability of further development of automated ticket and boarding pass (ATB) systems.

2.68 Concern with rapidly increasing distribution costs led two airlines in the United States to reduce commissions on international full fare tickets from 10 to 8 per cent. By year end there were indications that other carriers were prepared to follow and that a similar action would be taken in respect of domestic tickets. In support of this move, the airlines asserted that commissions had grown from 4.5 per cent of total operating expenses in 1978 to more than 11 per cent in 1994.

2.69 At the international level, airline concerns with the costs of distribution led to complaints to regulatory authorities in Europe and in the United States regarding the level and nature of booking fees charged by CRS vendors as well as booking fees resulting from duplicate and fictitious reservations.

2.70 In March 1994 the ICAO Council initiated its planned review of the ICAO Code of Conduct for the Regulation and Operation of Computer Reservation Systems but decided to postpone the completion until after the World-wide Air Transport Conference (Montreal, 23 November-6 December 1994) in order to include consideration of the Conference's conclusions on computer reservation systems. The Council also included in its review the implications for ICAO's work on CRS of the General Agreement on Trade in Services (GATS) which includes computer reservation systems in its Annex on Air Transport Services. In the meantime, the ICAO Code remains in effect. The review of the Code is expected to be completed in early 1996.

TRAFFIC

2.71 Indicators are given below of the development of airline scheduled traffic in 1994, international and domestic, including rates of growth, load factors and the ranking of airlines, States and city-pairs by volume of airline traffic, along with some estimates regarding the development of non-scheduled traffic.

Scheduled: world totals

2.72 The total scheduled traffic (domestic plus international) carried by the airlines of the 183 Contracting States of ICAO in 1994 is estimated at about 272 billion tonne-kilometres performed, an increase of about 9 per cent over 1993. The airlines carried a total of about 1 203 million passengers in 1994, compared with 1 141 million passengers in 1993, and 20 million tonnes of freight compared with some 18 million tonnes in 1993 (Table 2-4). The passenger and over-all (weight) load factors both increased one percentage point to 66 and 59 per cent respectively.

2.73 In 1994, international scheduled traffic in particular showed strong growth, with increases of about 10 per cent in tonne-kilometres performed, 6 per cent in passengers carried, and some 11 per cent in freight tonnes carried. International traffic accounted for 53 per cent of total passenger-kilometres performed, 82 per cent of the freight tonne-kilometres performed and some 62 per cent of the total tonne-kilometres performed.

2.74 Domestic traffic increased some 6 per cent from about 94 billion tonne-kilometres performed in 1993 to almost 100 billion tonne-kilometres performed in 1994. This increase was achieved in part through a 7 per cent increase in domestic traffic in the United States following two years of stagnation in that market, which represents almost 65 per cent of the world's total domestic air traffic.

Table 2-4. Scheduled services of airlines of ICAO Contracting States

	Passengers carried (millions)	Passenger-km performed (millions)	Passenger load factor (%)	Freight tonnes carried (millions)	Freight tonne-km performed (millions)	Mail tonne-km performed (millions)	Total tonne-km performed (millions)	Weight load factor (%)
TOTAL (international plus domestic)								
1993	1 141	1 954 000	65	17.5	67 480	5 230	250 080	58
1994	1 203	2 086 000	66	20.0	76 530	5 470	271 500	59
Percentage change	5.4	6.8	1.0	14.3	13.4	4.6	8.6	1.0
INTERNATIONAL								
1993	321	1 049 000	66	10.1	56 000	2 200	155 590	61
1994	340	1 136 000	68	11.2	64 090	2 260	171 680	63
Percentage change	5.9	8.3	2.0	10.9	14.4	2.7	10.3	2.0
DOMESTIC								
1993	820	905 000	63	7.4	11 480	3 030	94 490	54
1994	863	950 000	64	8.8	12 440	3 210	99 820	55
Percentage change	5.2	5.0	1.0	18.9	8.4	5.9	5.6	1.0

Source: ICAO Air Transport Reporting Form A-1.

Table 2-5. Growth of scheduled traffic by region of airline registration: 1993-1994
(annual percentage change)

Region of registration	Passengers carried	Passenger-kilometres	Freight tonne-km performed	Mail tonne-km performed	Total tonne-km performed
TOTAL (international plus domestic)					
Africa	3.1	5.6	19.1	-23.1	8.9
Asia and Pacific	10.6	12.0	12.7	4.0	12.6
Europe	-2.3	3.4	12.8	5.9	6.4
Middle East	8.2	6.5	15.5	14.9	9.5
North America	7.2	6.1	15.7	5.2	7.9
Latin America and Caribbean	6.0	6.9	5.3	-13.6	4.8
Total	5.4	6.8	13.4	4.6	8.6
INTERNATIONAL					
Africa	4.1	6.3	18.9	-16.7	9.5
Asia and Pacific	7.6	11.8	11.9	0.0	11.7
Europe	5.7	8.6	14.2	5.4	10.5
Middle East	5.2	5.9	16.0	15.7	9.8
North America	4.4	4.7	20.7	3.1	9.5
Latin America and Caribbean	6.1	7.3	9.1	-4.0	5.7
Total	5.9	8.3	14.4	2.7	10.3

Source: ICAO Air Transport Reporting Form A-1.

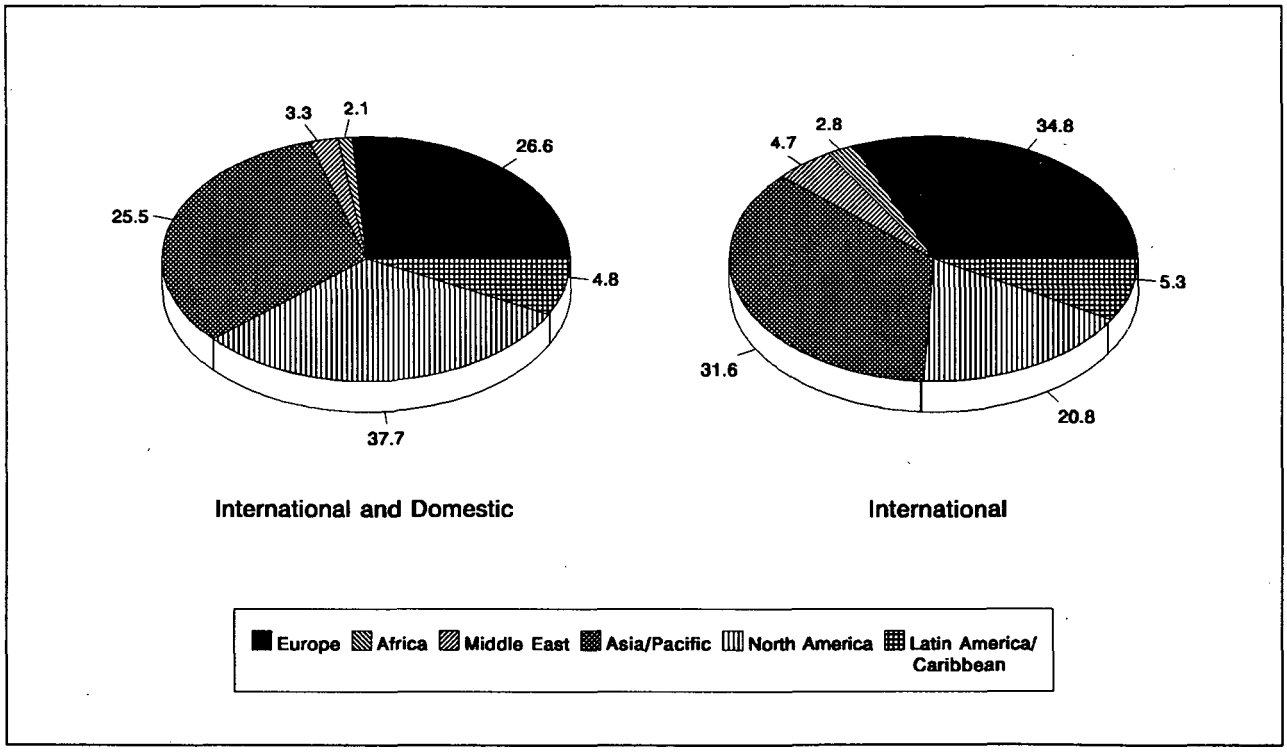
Scheduled: regional breakdown

2.75 Between 1993 and 1994 development in total and international scheduled traffic varied considerably among regions of carrier registration with respect to both passengers and freight. In terms of total passenger-kilometres performed, the increase in traffic ranged from just over 3 per cent for the airlines registered in Europe to 12 per cent for those registered in Asia/Pacific (Table 2-5). International scheduled services also posted increases in passenger-kilometres performed for all regions, ranging from about 5 per cent for airlines registered in North America to some 12 per cent for those registered in Asia/Pacific. With the exception of Latin America/Caribbean, double digit per cent increases in total and international freight tonne-kilometres performed were recorded for all regions.

2.76 The differences in the regional traffic development between 1993 and 1994 caused some small changes in the distribution of the regional traffic. The regional distribution for total

and for international scheduled traffic in 1994 is shown in Figure 2-1 (detailed traffic data by region are shown in Table A1-1 in Appendix 1). In terms of total scheduled traffic (international plus domestic) in 1994, the airlines of North America carried about 38 per cent of the total world traffic. However, the largest share of international scheduled traffic (about 35 per cent) was carried by the airlines of Europe.

2.77 In 1994 airlines registered in Europe showed the highest average annual weight load factor on international scheduled services (about 67 per cent), while those in Africa showed the lowest average load factor (some 52 per cent). Compared with 1993, the weight load factors for international scheduled services (shown in Table A1-1 in Appendix 1) represent an increase in average weight load factor of about three percentage points for the airlines of Europe and Africa, and some two percentage points for those of North America and Latin America/Caribbean. For the airlines of Asia/Pacific, the average weight load factor decreased about one percentage point, while there was no change in the average weight load factor for airlines of the Middle East between 1993 and 1994.



Source: ICAO Air Transport Reporting Form A-1.

Figure 2-1. Percentage distribution of scheduled traffic in 1994 according to region of registration of airline — total tonne-kilometres performed

Scheduled: carrier rankings

2.78 Table 2-6 shows the top 30 air carriers in the world in 1994 in terms of the over-all volume of passenger-kilometres performed, freight and mail tonne-kilometres performed and total (passenger, freight and mail) tonne-kilometres performed, compared with the ranking of the same carriers in 1993 and in 1985. Table 2-7 shows the top 30 air carrier rankings according to the same parameters but in terms of international scheduled traffic.

2.79 These tables show the rise in ranking of a number of Asian carriers associated with the relatively high growth in traffic in that region. They also illustrate the restructuring which has taken place in the air transport industry in the United States. In this respect the changes in ranking of the United States carriers operating international scheduled services are particularly striking. In 1985 Pan American, now defunct, ranked number two (after British Airways) in the world in terms of passenger-kilometres performed and fifth in terms of total traffic carried, and TWA which ranked fourth and eighth respectively in 1985 moved to 29th and 34th in 1994. On the other hand, United which ranked 48th (passenger-kilometres) and 51st (total) in 1985, rose to second and fifth respectively by 1994, American moved from 20th to fifth in terms of passenger-kilometres and from 32nd to ninth in total, and Delta moved from 40th to tenth (passenger-kilometres) and from 46th to 13th (total) over the same period.

Scheduled: country rankings

2.80 Rankings for the top 30 countries or groups of countries by volume of scheduled traffic generated by their airlines in 1994, 1993 and 1985 according to the same parameters of passenger-kilometres, freight and mail tonne-kilometres and total (passenger, freight and mail) tonne-kilometres, for over-all and for international services, are presented in Tables 2-8 and 2-9. In 1994, approximately 43 per cent of the total volume of scheduled passenger, freight and mail traffic on international and domestic services was accounted for by the carriers of two countries, the United States and the United Kingdom (36 and 7 per cent, respectively). On international services, about 30 per cent of all traffic was carried by the airlines of the same two countries, the United States and the United Kingdom (19 and 11 per cent, respectively).

Scheduled: city-pair rankings

2.81 The 25 largest city-pair traffic flows in terms of passengers carried on international scheduled services represented a total of about 37 million passengers in 1993 (Table 2-10; owing to incomplete data it has not been possible to include figures for 1994). This represents some 11 per cent of the world total of international scheduled passengers. The table shows that of the 25 major passenger flows 11 involved international routes within eastern Asia, six routes were within Europe, three routes were across the North Atlantic, two routes each within North America and across North-Mid Pacific, and one route between Europe and Asia. In terms of cities, London and Tokyo appear most frequently, nine and seven times respectively. Almost all the city-pairs shown involve over-water sectors.

Table 2-6. Top 30 scheduled air carriers in 1994 and their ranking in 1993 and 1985 in terms of TOTAL (international and domestic) scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
		Ranking					Ranking					Ranking		
Carrier	1994 (millions)	1994	1993	1985	Carrier	1994 (millions)	1994	1993	1985	Carrier	1994 (millions)	1994	1993	1985
United	173 798	1	1	3	Federal Express	6 515	1	1	12	United	18 801	1	1	2
American	158 866	2	2	2	Lufthansa	5 546	2	2	4	American	17 368	2	2	3
Delta	138 854	3	3	6	Air France	4 385	3	3	5	Delta	14 762	3	3	10
Northwest	93 083	4	4	10	Korean Air Lines	3 928	4	4	8	Northwest	11 837	4	4	11
British Airways	83 981	5	5	8	JAL	3 779	5	5	3	Lufthansa	11 208	5	6	12
Aeroflot	64 233	6	6	1	Northwest	3 390	6	6	6	British Airways	11 081	6	5	8
JAL	62 936	7	9	9	KLM	3 334	7	8	7	Air France	9 552	7	8	7
USAir	61 046	8	8	23	Singapore Airlines	3 318	8	9	11	JAL	9 388	8	7	4
Continental	60 353	9	7	12	British Airways	3 071	9	11	9	Singapore Airlines	7 586	9	10	15
Lufthansa	56 536	10	10	13	United	3 030	10	7	13	KLM	7 180	10	12	14
Air France	50 093	11	11	11	American	2 952	11	10	26	Korean Air Lines	6 660	11	13	18
Qantas	48 235	12	16	20	Cathay Pacific	2 434	12	12	16	Aeroflot	6 659	12	9	1
Singapore Airlines	44 947	13	12	14	Delta	2 163	13	13	25	Federal Express	6 515	13	14	43
KLM	40 939	14	14	17	Qantas	1 695	14	14	19	Continental	6 291	14	11	16
TWA	39 516	15	15	5	Swissair	1 459	15	17	21	Qantas	6 215	15	16	19
All Nippon Airways	38 523	16	13	16	Nippon Cargo	1 422	16	16	43	USAir	5 935	16	15	31
Cathay Pacific	32 710	17	17	28	Alitalia	1 399	17	15	15	Cathay Pacific	5 551	17	17	22
Southwest	31 841	18	19	36	Thai Airways	1 273	18	18	37	TWA	4 293	18	18	6
Korean Air Lines	30 829	19	18	29	Varig	1 178	19	19	20	Alitalia	4 122	19	20	21
Alitalia	30 259	20	20	25	El Al	961	20	22	22	All Nippon Airways	3 921	20	19	28
Thai Airways	25 242	21	22	41	Air Canada	919	21	23	17	Thai Airways	3 552	21	21	41
Air Canada	22 775	22	24	15	Aeroflot	878	22	20	2	Swissair	3 245	22	23	23
Iberia	22 531	23	21	19	All Nippon Airways	852	23	24	38	Varig	3 175	23	22	29
Varig	21 405	24	23	32	Saudia	835	24	25	28	Air Canada	2 985	24	24	17
Canadian	20 715	25	25	31	Continental	815	25	21	32	Southwest	2 977	25	26	49
Malaysia Airlines	20 335	26	29	50	Malaysia Airlines	807	26	26	41	Iberia	2 642	26	25	20
America West	19 628	27	28	76	Asiana[2]	763	27	29	—	Canadian	2 547	27	27	32
SAS	18 468	28	27	30	United Parcel Service[2]	739	28	32	—	Malaysia Airlines	2 507	28	29	48
Swissair	18 408	29	30	27	TWA	707	29	28	14	Saudia	2 477	29	28	24
Saudia	18 250	30	26	24	Garuda	677	30	33	49	Garuda	2 260	30	31	45

1. Some 1994 data are rounded estimates, thus the ranking may change when final data become available.
2. Started operations in 1988.

Source: ICAO Air Transport Reporting Form A-1 and IATA.

Table 2-7. Top 30 scheduled air carriers in 1994 and their ranking in 1993 and 1985 in terms of INTERNATIONAL scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
		Ranking					Ranking					Ranking		
Carrier	1994 (millions)	1994	1993	1985	Carrier	1994 (millions)	1994	1993	1985	Carrier	1994 (millions)	1994	1993	1985
British Airways	81 475	1	1	1	Lufthansa	5 484	1	1	2	British Airways	10 866	1	1	2
United	67 376	2	2	48	Air France	4 258	2	2	3	Lufthansa	10 659	2	2	3
Lufthansa	51 567	3	3	6	Korean Air Lines	3 845	3	3	6	Air France	8 599	3	3	4
JAL	49 084	4	5	3	JAL	3 481	4	4	1	JAL	8 047	4	5	1
American	48 524	5	4	20	KLM	3 334	5	5	5	United	7 899	5	4	51
Singapore Airlines	44 947	6	6	7	Singapore Airlines	3 318	6	6	8	Singapore Airlines	7 586	6	6	7
Air France	42 128	7	10	5	British Airways	3 067	7	7	7	KLM	7 179	7	7	6
KLM	40 935	8	8	9	Cathay Pacific	2 434	8	9	12	Korean Air Lines	6 236	8	8	10
Northwest	39 493	9	7	8	Federal Express	2 357	9	8	94	American	6 089	9	9	32
Delta	38 657	10	9	40	Northwest	2 037	10	10	10	Northwest	5 621	10	10	9
Qantas	36 747	11	11	10	United	1 785	11	11	59	Cathay Pacific	5 551	11	12	12
Cathay Pacific	32 710	12	12	13	American	1 686	12	12	42	Qantas	4 945	12	11	11
Korean Air Lines	26 575	13	13	16	Qantas	1 520	13	13	13	Delta	4 629	13	13	46
Alitalia	24 450	14	14	12	Swissair	1 453	14	16	14	Alitalia	3 575	14	14	14
Thai Airways	22 619	15	15	21	Nippon Cargo	1 422	15	15	33	Thai Airways	3 288	15	15	26
Swissair	18 252	16	17	14	Alitalia	1 375	16	14	11	Swissair	3 225	16	16	15
Malaysia Airlines	17 024	17	19	38	Thai Airways	1 246	17	17	27	Federal Express	2 357	17	18	127
Iberia	17 022	18	16	11	Delta	1 121	18	19	51	Varig	2 307	18	17	21
Air New Zealand	14 770	19	26	28	El Al	961	19	18	15	Malaysia Airlines	2 205	19	20	34
Varig	14 759	20	20	23	Varig	872	20	20	17	Iberia	2 052	20	19	16
Aeroflot	14 345	21	18	15	Malaysia Airlines	774	21	22	34	Garuda	1 983	21	26	37
SAS	14 306	22	22	19	Saudia	763	22	21	23	Air New Zealand	1 951	22	29	29
Garuda	14 257	23	25	32	United Parcel Service[3]	739	23	24	—	Air Canada	1 921	23	27	17
Canadian	13 858	24	23	26	Asiana[3]	733	24	25	—	Saudia	1 862	24	21	18
Air Canada	13 503	25	27	17	Air Canada	697	25	23	21	El Al	1 820	25	28	22
Saudia	12 215	26	24	18	Air Hong Kong[3]	667	26	26	—	Aeroflot	1 782	26	22	19
Virgin Atlantic	12 090	27	30	74	Garuda	627	27	28	44	Canadian	1 779	27	25	31
PAL	11 686	28	29	24	Air New Zealand	542	28	31	28	SAS	1 770	28	23	20
TWA	11 356	29	28	4	Canadian	523	29	30	31	PAL	1 546	29	30	28
All Nippon Airways[2]	10 503	30	31	—	Iberia	520	30	29	20	Virgin Atlantic	1 523	30	35	74

1. Some 1994 data are rounded estimates, thus the ranking may change when final data become available.
2. Started international scheduled operation in 1986.
3. Started operations in 1988.

Source: ICAO Air Transport Reporting Form A-1 and IATA.

Table 2-8. Top 30 countries or groups of countries in 1994 and their ranking in 1993 and 1985 in terms of TOTAL (international and domestic) traffic carried on their airlines' scheduled services[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Country or group of countries	Estimated 1994 (millions)	Ranking 1994	1993	1985	Country or group of countries	Estimated 1994 (millions)	Ranking 1994	1993	1985	Country or group of countries	Estimated 1994 (millions)	Ranking 1994	1993	1985
United States	824 109	1	1	1	United States	22 361	1	1	1	United States	97 140	1	1	1
United Kingdom	139 085	2	2	4	United Kingdom	6 643	2	3	5	United Kingdom	19 734	2	2	4
Japan	117 996	3	3	3	Japan	6 340	3	2	2	Japan	16 246	3	3	3
Russian Federation[2]	83 824	4	4	2	Germany	5 572	4	4	6	Germany	11 722	4	4	6
France	67 535	5	5	5	Republic of Korea	4 691	5	5	8	France	11 339	5	6	5
Australia	63 727	6	6	7	France	4 538	6	6	4	Russian Federation[2]	8 466	6	5	2
Germany	61 951	7	7	8	Netherlands	3 337	7	7	7	Republic of Korea	8 191	7	7	12
China[3]	51 395	8	8	19	Singapore	3 318	8	8	10	Australia	7 772	8	8	8
Singapore	44 947	9	9	9	Australia	1 802	9	9	12	Singapore	7 586	9	9	10
Canada	43 490	10	10	6	China[3]	1 714	10	10	23	Netherlands	7 365	10	10	9
Netherlands	42 887	11	11	10	Canada	1 588	11	11	9	China[3]	5 535	11	12	21
Republic of Korea	39 579	12	12	20	Brazil	1 535	12	12	11	Canada	5 532	12	11	7
Italy	31 750	13	13	14	Switzerland	1 459	13	14	14	Brazil	4 375	13	13	11
Brazil	31 205	14	14	11	Italy	1 401	14	13	13	Italy	4 255	14	14	13
Spain	26 404	15	15	12	Thailand	1 273	15	15	21	Thailand	3 552	15	15	20
Thailand	25 242	16	16	21	Israel	961	16	17	15	Switzerland	3 287	16	17	15
Mexico	23 870	17	20	13	Russian Federation[2]	920	17	16	3	Spain	2 982	17	16	14
Indonesia	22 088	18	18	22	Gulf States[5]	872	18	19	36	Indonesia	2 762	18	18	27
Scandinavia[4]	20 883	19	17	17	Saudi Arabia	835	19	18	19	Saudi Arabia	2 517	19	19	16
Malaysia	20 335	20	22	30	Malaysia	807	20	20	28	Malaysia	2 507	20	21	30
Switzerland	18 858	21	21	18	Indonesia	740	21	21	34	Scandinavia[4]	2 417	21	20	18
Saudi Arabia	18 738	22	19	15	Chile	655	22	22	38	Gulf States[5]	2 398	22	22	33
India	17 045	23	23	16	Spain	627	23	23	17	New Zealand	2 171	23	23	26
New Zealand	16 952	24	25	25	India	585	24	29	18	Mexico	2 132	24	24	19
Gulf States[5]	16 306	25	24	32	New Zealand	571	25	27	25	India	2 091	25	25	17
Philippines	13 977	26	26	24	Scandinavia[4]	532	26	24	20	Israel	1 836	26	26	23
South Africa	12 146	27	27	23	Colombia	512	27	26	24	Philippines	1 769	27	27	25
Argentina	11 415	28	29	27	Pakistan	450	28	28	26	Pakistan	1 385	28	29	28
Pakistan	10 246	29	28	28	Belgium	442	29	25	16	Argentina	1 373	29	30	29
Israel	9 720	30	30	29	Philippines	396	30	30	27	South Africa	1 356	30	28	22

1. Most 1994 data are rounded estimates, thus the ranking may change when final data become available.
2. Traffic is for 12 Commonwealth of Independent States that are ICAO Contracting States, namely: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.
3. Not including the Taiwan Province.
4. Three States, Denmark, Norway and Sweden, are partners in the consortium airline "Scandinavian Airlines System".
5. Four States, Bahrain, Oman, Qatar and United Arab Emirates, are partners in the multinational airline "Gulf Air".

Source: ICAO Air Transport Reporting Form A-1.

Table 2-9. Top 30 countries or groups of countries in 1994 and their ranking in 1993 and 1985 in terms of traffic carried on their airlines' INTERNATIONAL scheduled services[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Country or group of countries	1994 (millions)	Ranking 1994	1993	1985	Country or group of countries	1994 (millions)	Ranking 1994	1993	1985	Country or group of countries	1994 (millions)	Ranking 1994	1993	1985
United States	228 888	1	1	1	United States	11 306	1	1	1	United States	32 075	1	1	1
United Kingdom	133 753	2	2	2	United Kingdom	6 631	2	2	4	United Kingdom	19 285	2	2	2
Japan	62 822	3	3	3	Japan	5 529	3	3	3	Japan	11 363	3	3	3
Germany	56 738	4	4	5	Germany	5 508	4	4	5	Germany	11 149	4	4	5
Singapore	44 947	5	5	6	Republic of Korea	4 578	5	5	7	France	8 782	5	5	4
France	43 940	6	7	4	France	4 291	6	6	2	Republic of Korea	7 586	6	7	8
Netherlands	42 814	7	6	7	Netherlands	3 337	7	7	6	Singapore	7 586	7	6	7
Australia	36 747	8	8	8	Singapore	3 318	8	8	8	Netherlands	7 359	8	8	6
Republic of Korea	33 422	9	9	14	Australia	1 521	9	9	10	Australia	4 945	9	9	9
Canada	27 360	10	10	9	Switzerland	1 453	10	11	12	Canada	3 700	10	11	10
Italy	24 799	11	11	11	Italy	1 375	11	10	9	Italy	3 604	11	10	11
Thailand	22 619	12	12	15	Thailand	1 246	12	13	17	Thailand	3 288	12	13	14
Brazil	18 749	13	15	20	Canada	1 220	13	12	11	Switzerland	3 262	13	12	12
Switzerland	18 651	14	14	12	Brazil	1 037	14	15	15	Brazil	2 834	14	14	18
Spain	18 170	15	13	10	China[3]	1 003	15	14	26	Gulf States[5]	2 392	15	16	29
Malaysia	17 024	16	17	30	Israel	961	16	16	13	Malaysia	2 205	16	17	27
Gulf States[5]	16 234	17	18	29	Gulf States[5]	873	17	17	34	Spain	2 155	17	15	13
Russian Federation[2]	15 219	18	16	13	Malaysia	774	18	19	29	Indonesia	2 065	18	22	30
Indonesia	14 871	19	20	27	Saudi Arabia	763	19	18	19	New Zealand	1 951	19	24	23
New Zealand	14 770	20	22	23	Indonesia	644	20	21	36	China	1 892	20	19	34
Scandinavia[4]	14 606	21	19	17	Chile	629	21	20	38	Russian Federation[2]	1 879	21	18	16
Saudi Arabia	12 215	22	21	16	New Zealand	542	22	26	23	Saudi Arabia	1 862	22	20	15
China[3]	11 748	23	24	34	Spain	525	23	22	16	Scandinavia[4]	1 827	23	21	17
Philippines	11 686	24	23	21	India	518	24	30	20	Israel	1 820	24	23	19
India	9 980	25	27	19	Russian Federation[2]	508	25	27	25	Philippines	1 546	25	25	22
Israel	9 544	26	25	22	Scandinavia[4]	503	26	24	18	India	1 435	26	28	20
Mexico	8 300	27	26	18	Colombia	478	27	25	22	Pakistan	1 144	27	27	25
South Africa	8 191	28	28	26	Belgium	442	28	23	14	Belgium	1 116	28	26	21
Pakistan	7 985	29	29	28	Pakistan	415	29	28	24	Argentina	1 005	29	32	33
Argentina	7 833	30	33	33	Philippines	345	30	29	27	South Africa	949	30	29	24

1. Most 1994 data are rounded estimates, thus the ranking may change when final data become available.
2. Traffic is for 12 Commonwealth of Independent States that are ICAO Contracting States, namely: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.
3. Not including the Taiwan Province.
4. *Three States, Denmark, Norway and Sweden, are partners in the consortium airline "Scandinavian Airlines System".*
5. Four States, Bahrain, Oman, Qatar and United Arab Emirates, are partners in the multinational airline "Gulf Air".

Source: ICAO Air Transport Reporting Form A-1.

Table 2-10. Scheduled passenger traffic on world's major international city-pairs
(top 25 city-pairs ranked by international passengers, 1993[1])

Rank	City-pair	Distance (km)	1993[1] (thousands)	1992 (thousands)	1993/92 %	1993/85 average
1	London-Paris	346	3 226	3 285	-1.8	4.3
2	London-New York	5 539	2 362	2 311	2.2	1.4
3	Hong Kong-Taipei	777	2 356	2 352	0.2	13.7
4	Kuala Lumpur-Singapore	335	2 208	2 072	6.6	6.2
5	Honolulu-Tokyo	6 134	1 933	2 130	-9.2	8.3
6	Bangkok-Hong Kong	1 711	1 790	1 672	7.1	9.0
7	Hong Kong-Tokyo	2 938	1 785	1 932	-7.6	4.0
8	Amsterdam-London	369	1 727	1 748	-1.2	4.8
9	Seoul-Tokyo	1 227	1 679	1 917	-12.4	7.5
10	Dublin-London	449	1 604	1 722	-6.9	7.4
11	Bangkok-Singapore	1 444	1 438	1 055	36.3	8.6
12	Jakarta-Singapore	906	1 371	1 273	7.7	6.2
13	Hong Kong-Singapore	2 578	1 333	1 043	27.8	7.8
14	Frankfurt-London	654	1 278	1 214	5.3	5.0
15	New York-Paris	5 833	1 082	1 183	-8.5	2.4
16	Los Angeles-Tokyo	8 752	1 070	1 040	2.9	4.8
17	London-Los Angeles	8 759	1 065	1 039	2.5	7.2
18	Singapore-Tokyo	5 356	1 061	1 082	-1.9	14.4
19	Brussels-London	349	1 052	1 001	5.1	6.2
20	Taipei-Tokyo	2 182	977	1 075	-9.1	2.2
21	Chicago-Toronto	699	942	924	1.9	4.4
22	Hong Kong-Manila	1 126	934	1 118	-16.5	5.7
23	London-Tokyo	9 590	869	908	-4.3	16.2
24	New York-Toronto	593	851	812	4.8	0.4
25	London-Zurich	787	824	867	-5.0	3.6
	TOTAL		36 817	36 775	0.1	6.0

1. Year ending 30 September 1993.

Source: ICAO Air Transport Reporting Form B.

2.82 Table 2-10 also gives an indication of the long-term growth in the traffic flows for the city-pairs concerned by including the average annual percentage increase between 1985 and 1993. The figures show that there were significant differences in the rate of growth amongst individual city-pairs and between route areas. Between 1985 and 1993 the number of passengers between the 11 city-pairs in eastern Asia and those across the North-Mid Pacific and between Europe and Asia increased at an average annual rate of about 8 per cent, those involving traffic within Europe grew at some 5 per cent, those across the North Atlantic almost 3 per cent, and those within North America some 2 per cent.

Non-scheduled

2.83 Total international non-scheduled passenger-kilometres performed throughout the world increased by an estimated 12 per cent in 1994 (Table 2-11). In 1994 the share of international non-scheduled air passenger traffic remained at about 16 per cent of over-all international air passenger traffic. According to preliminary estimates in 1994 the shares of charter operators and scheduled airlines in the carriage of the non-scheduled traffic were 53 per cent and 47 per cent respectively. Non-scheduled traffic in Europe remains the largest single component of the world charter market. Domestic non-scheduled passenger traffic is estimated to represent about 9 per cent of total non-scheduled passenger traffic and under 2 per cent of total domestic passenger traffic world-wide. Non-scheduled cargo operations tend to be largely of an *ad hoc* nature and little information is available as to their volume.

FLEETS

2.84 The evolution of the commercial air transport fleets summarized below does not generally include aircraft fleet and manufacturer data for the Commonwealth of Independent States (CIS) and China. However, statistics on certain types of aircraft manufactured in the CIS and employed in the fleets of States other than the CIS and China are included in the tables shown unless otherwise stated. Also, unless otherwise stated, statistics of aircraft having a maximum take-off mass of less than 9 000 kg (20 000 lbs) are not included.

Orders and Deliveries

2.85 In 1994 the number of turbo-jet aircraft ordered was 306 compared with 347 in 1993. The financial commitment represented by orders placed in 1994 for these aircraft is estimated to be about $14 billion, somewhat less than the $17 billion estimated for 1993. In 1994, 513 aircraft were delivered compared with 654 aircraft in 1993. The backlog of unfilled orders declined from 2 156 aircraft at the end of 1993 to 1 878 aircraft at the end of 1994. The status of orders and deliveries for the year 1994 is shown in Table A1-2 in Appendix 1, which gives data by manufacturer and model for turbo-jet and turboprop aircraft.

2.86 The turbo-jet types shown in Table 2-12 were most active in 1994 in terms of orders and deliveries, accounting for about 75 per cent of the orders, and for about 45 per cent each of the deliveries made and 40 per cent of the backlog of unfilled orders in 1994. The number of turboprop aircraft ordered in 1994 was 179, and 150 aircraft were delivered during the year. The backlog of turboprop aircraft was 277 at the end of the year.

2.87 With the reduction in the number of new orders, the major aircraft manufacturers have resorted to cut production costs through productivity gains in order to offer lower unit prices. For example, the Boeing Aircraft Company has reduced the order-to-delivery cycle for its wide-body aircraft from 18 months to about 10.5 months and was expected to reduce it further to some 8 months. Similarly, Airbus Industrie reduced its production cycle for wide-body aircraft from 15 to 12.5 months and plans to reduce it to 9 months in 1995.

Composition

2.88 Between 1985 and 1994 the number of commercial air transport fixed-wing aircraft in service with a take-off mass of 9 000 kg and over increased by over 60 per cent, from 9 365 to 15 010 as shown in Table 2-13. During this period, the number of jet aircraft increased from 7 039 to 11 710 rising from about 75 per cent to 78 per cent of the fleet, while turboprop aircraft increased from 1 590 to 2 930, or from 17 to about 19 per cent. On the other hand, the number of piston-engine aircraft declined by almost 50 per cent, from 736 to 370, and now constitutes less than 3 per cent of the total world fleet.

2.89 It is estimated that in November 1994 there were some 968 commercial jet aircraft in storage, i.e. some 12 per cent less than the 1 103 aircraft in storage in January 1994. Among them, the share of aircraft complying with the ICAO noise standards in Annex 16, Volume I, Chapter 3 remained at about one-third of the total, the same proportion as in 1993. During the year the number of commercial jets for sale or lease declined from 713 to 534 (with a peak of 743 units in March). The proportion of new generation aircraft available for sale or lease decreased by 4 percentage points to nearly 16 per cent.

2.90 During 1994 the market value of new generation wide- and narrow-body aircraft remained fairly stable with a marginal increase in price for the newest aircraft. Prices for the older models, however, declined considerably, with many losing more than one-fifth of their market value compared with 1993.

2.91 It is estimated that at the end of 1993 (completed data for 1994 not yet being available), there were 14 681 fixed-wing civil aircraft (cf. Table 2-13) and some 179 rotary-wing aircraft, for a total of 14 860 civil aircraft on register with a maximum take-off mass of 9 000 kg or more. In addition, there were 32 010 fixed and rotary-wing civil aircraft of lesser mass, for a total of some 46 870 fixed and rotary-wing civil aircraft registered with commercial air transport operators in ICAO Contracting States, excluding the CIS (with the exception of Ukraine) and China. Table 2-14, which gives the regional distribution of registration of these aircraft, shows that some 43 per cent of all aircraft used by commercial operators were registered in North America.

Leasing Developments

2.92 At the end of 1994 there were some 40 operating leasing companies owning 1 820 jet aircraft valued at some $36 billion compared with some 1 900 jet aircraft and $34 billion in 1993. About 62 per cent of all commercial jet aircraft available for operating leases were owned by just two companies, both of which are based in the United States: the General Electric Capital Corporation (835 aircraft) and the International Lease Finance Corporation (291 aircraft).

Table 2-11. Estimated international non-scheduled revenue passenger traffic, 1993-1994

Category	Millions of passenger-kilometres performed 1993	1994	Annual change (%) 1994/93
Scheduled carriers	88 600	101 100	14.1
% of total carriers	46	47	
Non-scheduled carriers	104 000	115 200	10.8
% of total carriers	54	53	
TOTAL NON-SCHEDULED TRAFFIC	192 600	216 300	12.3
Scheduled traffic	1 048 900	1 136 100	8.3
Total traffic	1 241 500	1 352 400	8.9
NON-SCHEDULED TRAFFIC AS PERCENTAGE OF TOTAL	15.5	16.0	

Source: ICAO Air Transport Reporting Forms A-1 and A-2.

Table 2-12. Main aircraft types ordered and delivered in 1994

Aircraft	Orders	Deliveries	Backlog
Boeing 737	70	121	391
Airbus A319	45	—	51
Canadair RJ	40	26	53
Airbus A340	28	24	97
BAe 146/RJ	25	22	31
Boeing 767	22	40	128

Source: Aircraft manufacturers.

Table 2-13. Commercial transport fleet[1] at the end of each year — 1985, 1993, 1994[2]

Year	TURBO-JET Number	TURBO-JET Percentage	TURBOPROP Number	TURBOPROP Percentage	PISTON-ENGINE Number	PISTON-ENGINE Percentage	Total aircraft all types
1985	7 039	75.2	1 590	17.0	736	7.8	9 365
1993	11 432	77.9	2 846	19.4	403	2.7	14 681
1994	11 710	78.0	2 930	19.5	370	2.5	15 010

1. Aircraft having a maximum take-off mass of less than 9 000 kg (20 000 lb) are not included.
2. Owing to lack of information, data for China and the Commonwealth of Independent States are not included, with the exception of the Ukraine from 1993 onwards.

Source: ICAO Air Transport Reporting Form H.

Table 2-14. Number of civil aircraft[1] on register by region at the end of 1993 — commercial air transport operators[2]

Region	AIRCRAFT MAXIMUM TAKE-OFF MASS: 9 000 kg and over: Turbo-jet	Turboprop	Piston	Total	Under 9 000 kg	Total
Africa	500	230	30	760	1 590	2 350
Asia and Pacific	1 470	540	10	2 020	5 170	7 190
Europe	2 770	990	10	3 770	7 520	11 290
Middle East	450	40	—	490	150	640
North America	5 450	960	240	6 650	13 490	20 140
Latin America and Caribbean	790	270	110	1 170	4 090	5 260
TOTAL	11 430	3 030	400	14 860	32 010	46 870

1. Includes fixed and rotary-wing aircraft.
2. Preliminary data. Excludes aircraft registered for China and the CIS with the exception of the Ukraine.

Source: ICAO Air Transport Reporting Form H.

2.93 In 1994, excluding China and the CIS for which complete data were not available, the proportion of jet aircraft owned by operating leasing companies went down by one percentage point to about 16 per cent of the total number of commercial jet aircraft. The number of aircraft leased by airlines from other institutions, other carriers and the aircraft manufacturers is also thought to be significant, hence the proportion of leased (as opposed to owned) aircraft in the industry is substantial. Among the aircraft manufacturers, Airbus Industrie set up the Airbus Finance Corporation in Dublin in 1994. Prior to this, Airbus had directly leased some 25 aircraft. Other aircraft manufacturers having similar organizations include British Aerospace and the Douglas Aircraft Company.

2.94 During the year the share of stored aircraft in the total fleet owned by leasing companies decreased almost 5 percentage points to about 10 per cent. Despite reductions in stored aircraft, both in terms of their number and as a proportion of the total, market conditions caused leasing rates to continue to fall. As a group, narrow-body aircraft complying with the ICAO noise standards in Annex 16, Volume I, Chapter 3, were the least affected by the reduction in leasing rates (less than 6 per cent); however, rates for narrow-body aircraft complying with Chapter 2 were some 9 to 25 per cent lower than in 1993. Among the wide-body aircraft, the rates for the latest models of the Boeing 747 and 767 suffered only a small reduction (about 2 to 4 per cent) whereas early models of the Airbus A300, the Boeing 747, and all models of Lockheed L-1011 and the McDonnell Douglas DC10 experienced decreases in rates between 10 and 20 per cent. Exceptions were the freighters, the Boeing 747-100F and McDonnell Douglas DC-30CF, for which rates decreased only some 6 to 7 per cent.

AIRCRAFT TECHNOLOGY

2.95 In 1994 the world's largest twin-engine airliner, the Boeing 777, made its maiden flight and started an intensive testing programme aimed at obtaining certification by May 1995, with its introduction into service during the following month. With development costs estimated at $4 billion, this aircraft is considered to be the last all-new airliner which will be developed in this century.

2.96 Also during the year Boeing started assembly of the first 767-300 freighter, for delivery in October 1995. The first all-freight aircraft by Airbus Industrie, the A300-600F, entered airline operations. A large version of this aircraft, the A300-600ST "Beluga", which has cargo volume twice that of Boeing 747-400F, made its first flight with certification expected by October 1995. Though intended primarily to transport large aircraft components for Airbus, the aircraft is also expected to be in demand among civil and military operators. The twin-engine Airbus A330 powered with General Electric CF6-80E1 engines went into commercial service in January 1994. A version powered with Pratt & Whitney PW4000 engines was certified and began operations in December. During 1994 Airbus also obtained certification for the A330 powered with Rolls Royce Trent 700 engines; delivery was expected to begin in February 1995. The A330 and the four-engine A340 were the first aircraft using satellite-based air navigation systems to be certified by the European Joint Airworthiness Authorities (JAA). The Douglas Aircraft Company proposed a quieter and longer-range version of its 298-passenger MD-11 aircraft, the MD-11ER, for delivery in March 1996.

2.97 During 1994 the second generation of wide-body twin-jet aircraft started extended-range twin-engine operations (ETOPS); 90- and 120-minute ETOPS were granted for the A330s powered by Pratt & Whitney and General Electric engines, respectively. Upon accumulating more engine hours, further approvals for 120- and 180-minute ETOPS were expected. The A300-600F with GE CF6-80-C2A5 engines operated by Federal Express received maximum ETOPS approval (180 minutes) from the JAA. A goal of the Boeing 777 flight test programme was to achieve a 180-minute ETOPS before entering commercial services.

2.98 During the year there were also some important developments in the mid-size medium-haul aircraft market. Commercial operations were started with versions of the Airbus A321 (185 seats) powered by International Aero Engines and CFM International engines. Boeing continued to upgrade its 737 family by launching the 737-800 (149-189 seats) for delivery in 1998. The first McDonnell Douglas MD-90 jetliner (158 seats) made its maiden flight; following its certification, delivery was to start in February 1995. Construction of the MD-95 100-seat twin-jet aircraft, first announced in 1991, was delayed once again to mid-1995. In the meantime, the company reconsidered its decision to build the aircraft in China and chose a location in the United States (Dallas) for its final assembly. In the Russian Federation, the certification programme of Tupolev twin-jet TU-204 (214 seats) was completed. A prototype of this aircraft powered with Rolls Royce engines and redesignated TU-224 made its maiden flight. During the year the Government of the Russian Federation ordered the construction of three Tupolev TU-156 by 1997. These are a modified version of the three-engine TU-154 which will be capable of operating using aviation fuel or liquid hydrogen. The first of five planned prototypes of the Tupolev TU-334 (86-102 seats) was rolled out but the first flight was delayed until May 1995. In December 1994 the Antonov An-70, a Ukrainian-built high-wing freighter powered by propfans, made its maiden flight.

2.99 With regard to the regional aircraft market, only one new type, the SAAB 2000 (50 seats), entered airline operations in 1994. This high-speed twin-turboprop is the first commercial aircraft to use an active noise control system to reduce engine noise in the cabin. The first production Fokker 70 regional jet took to the air in July; in October, the type earned simultaneous certification from the Netherlands and United States authorities. The 50-seat version of the N-250-100 regional turboprop, the first commercial aircraft to be designed and built entirely in Indonesia, was rolled out by the Industri Pesawat Terbang Nusantara (IPTN). The aircraft is scheduled for commercial production by late 1997. The first production version of the British Aerospace Jetstream 61 (70 seats) made its first flight, with certification expected in 1995. Avions de Transport Régional's (Aérospatiale/Alenia) ATR 42-500 (46-50 seats) made its first flight and entered the test phase. Certification is expected in May 1995 and first delivery the following month. In Brazil, Embraer began production of its EMB-120ER Advanced with delivery scheduled during the year. Longer-range versions of the Dornier DO-328 and the Canadair Series 100 were certified during 1994. The Ukrainian-designed Antonov An-38 regional/utility aircraft (27 seats) powered with two Western turboprops made its maiden flight and was on target for certification in 1995. A second version of the An-38 with Russian-built engines was also scheduled to enter the test programme. The Antonov Design Bureau also announced a twin turboprop, the An-140 (46-52 seats), which is expected to fly in 1995.

2.100 Aerospace companies in Europe, Japan, Russia and the United States continued to study the environmental, economic and technical issues associated with the development of a

high-speed civil transport (HSCT). In 1994 the United States allocated some $1.5 billion to develop key technologies in structures and materials, aerodynamics and avionics for the HSCT. A decision on whether to build such an aircraft, however, is not expected before 2001. In Europe, Aerospatiale, British Aerospace and Deutsche Aerospace (DASA) signed a draft accord on a joint project, the European Supersonic Research Programme, to design a 250-passenger aircraft capable of flying at Mach 2 and with a range of 10 000 kilometres.

2.101 In 1994 Boeing and four European aerospace manufacturers extended their joint study on the very large commercial aircraft (VLCT, 600-800 seats) until mid-1995. Airbus Industrie unveiled a double-deck design, the A3XX-100 aircraft (530-840 passengers), which the company might launch if the joint study with Boeing proves inconclusive. Manufacturers estimate the development costs of the HSCT at around $20 billion and those of a VLCT at between $8 and $15 billion, depending on size. Considering the scale of investment needed for these projects, many experts believe that only one of them will be feasible.

2.102 In 1994 all major aircraft engine manufacturers reached the final development stages of the very large turbofan engines needed to power the new generation of wide-body twin-engine aircraft. Pratt & Whitney certified the PW4084 at 376 kN take-off thrust. This engine is the most powerful derivative of the PW4000 family and powered the first Boeing 777. A less powerful derivative of the PW4000, the PW4168 (284-302 kN), entered commercial service on the Airbus A330. Certification of the all-new General Electric GE90 engine at 400 kN was rescheduled from the end of 1994 to early 1995 with expected entry into service on the Boeing 777 in the third quarter of 1995. Rolls Royce developed two derivatives of the RB211, the Trent 700 which was certified on the A330 and the Trent 800 (400 kN) with certification set for early 1995. During the year efforts were also made at reducing engine maintenance costs and improving engine emission and noise levels of the smaller engines such as the new variants of the General Electric/Snecma CFM-56 (which powers the Airbus 340). Using technology developed for the Trent 800, Rolls Royce launched a new variant of the RB211-135 which is expected to have significantly lower engine emission levels.

2.103 During 1994, consolidation and new alliances were also in evidence among the aircraft and engine manufacturers. Subject to approval by the United States Government, Rolls Royce acquired Allison Engines, the United States-based turboprop and small turbofan engine manufacturer. The German engine manufacturer MTU and Pratt & Whitney decided to proceed with the joint development of a new engine in the 67-107 kN thrust range after their initial partners, General Electric and Snecma of France abandoned the project. The Republic of Korea and China reached an agreement to develop a new 80-100 seat passenger jet aircraft. Boeing, in co-operation with Japanese and Chinese companies, launched a feasibility study on jointly building a similar aircraft. Many North American and European aircraft manufacturers continued to relocate parts of their production to other regions of the world, predominantly in Asia. The Douglas Aircraft Company lined up major risk-sharing partners in Germany, Italy, Japan, the Republic of Korea and the United Kingdom for the production of the MD-95. During the year there were also numerous co-operative initiatives between Russian aerospace companies and western manufacturers. Russian expertise was also in increasing demand among Asian aerospace companies.

PERSONNEL

2.104 Between 1993 and 1994 there was little change in the number of staff employed by the world's scheduled airlines (excluding those of the CIS and China). Employment had peaked at 1.53 million in 1989 and it is estimated on a preliminary basis that in 1994 it remained at 1.51 million, the same as in 1993. However, the number of staff employed by the international scheduled airlines fell for the fifth year in succession (from a peak of about 1.15 million in 1988 and 1989 to about 1.12 million in 1994). Employment among the domestic scheduled airlines is estimated to have increased slightly to some 0.39 million in 1994 from about 0.38 million during the previous two years.

2.105 These generic figures cannot fully describe the over-all impact of employment changes in the airline industry, since they encompass both recruitment by some airlines and the lay-offs by other airlines which in many instances do not involve the same personnel.

2.106 During 1994, many major airlines continued with their efforts to reduce labour costs, in part through staff reductions. Also in view of their employers' financial difficulties, some labour unions agreed to make concessions in terms of work-rules, productivity, salaries and/or other benefits. Some management staff also took voluntary or enforced cuts in remuneration. There were also instances where staff agreed to concessions in exchange for equity in the company. In 1994 this approach spread from North America to other regions such as Europe (Air France, Iberia) and Latin America (Aerolineas Argentinas and Varig).

2.107 In the United States, United Airlines became the largest employee-owned company in the world when workers gained control of 55 per cent of the carrier in exchange for an estimated $5 billion in savings in staff costs over a 10-year period. Southwest Airlines signed a 10-year agreement with its pilots which includes a 5-year wage freeze in exchange for stock options. Contrary to the prevailing trend, some labour negotiations resulted in an increase in remunerations (Lufthansa and Philippine Airlines).

2.108 During the year, at least a dozen major international airlines in Europe, Africa, Asia and Latin America were affected by the industrial action of their staff. Regional airlines had a smaller number of reported disruptions with European operators accounting for nearly all of them.

FINANCES

Financial Results

2.109 Preliminary estimates for 1994 indicate that the world's scheduled airlines as a whole experienced an operating profit of 3.2 per cent of total operating revenues, compared with 1.1 per cent in 1993. This is the second successive year of operating profit following three years of operating loses (1990-1992). The operating revenues of scheduled airlines (excluding operations within the CIS) are tentatively estimated at $247.5 billion in 1994, an increase of

some 10 per cent compared with the $226 billion earned in 1993. Expressed in United States currency, there was a small reduction in operating revenues per tonne-kilometre performed (from 88.5 cents in 1993 to an estimated 88.2 cents in 1994). The operating expenses for the same airlines are tentatively estimated at $239.5 billion in 1994, an increase of 7 per cent over the $223.7 billion incurred in 1993. Operating expenses per tonne-kilometre performed fell by some 3 per cent from 87.6 cents in 1993 to 85.4 cents in 1994.

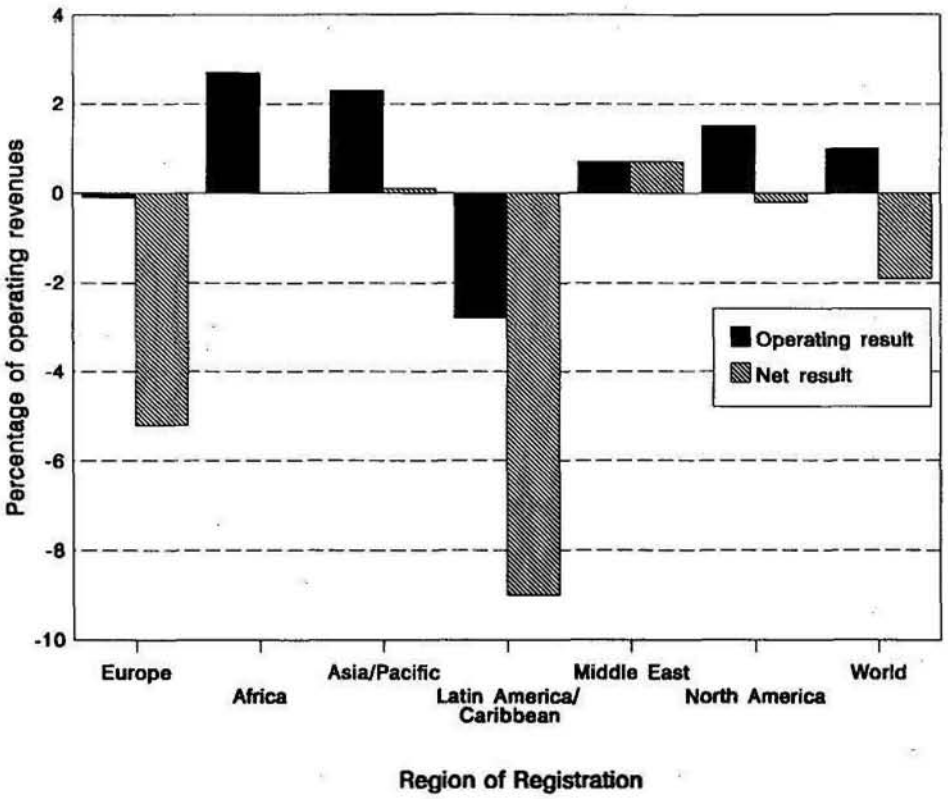
2.110 The estimated operating result for the world's scheduled airlines is the difference between estimated operating revenues and expenses and is therefore subject to a relatively wide margin of error. For 1994, the estimated operating profit of about $8 billion represents a significant improvement over the 1993 operating profit of $2.3 billion. The better operating results in 1994 reflect the generally improved economic situation, the encouraging traffic growth, declining fuel prices and airline efforts around the world to keep capacity increases in check and reduce operating costs.

2.111 The net result is derived from the operating result by taking into account the non-operating items and taxes. Preliminary estimates suggest that in 1994 the net result for the world's scheduled airlines would be marginally negative. This would represent a significant improvement over the 1993 net loss of $4.4 billion, representing 1.9 per cent of operating revenues. Information on both operating and net results over the period 1983-1993 and distribution of operating revenues and expenses by item in 1983 and 1993 may be found in Tables 5-4 and 5-5 in Chapter 5.

2.112 The estimates of the world's scheduled airlines as a whole do not portray the considerable difference in results achieved by individual airlines. In 1993 about 55 per cent of airlines experienced operating profits, with 45 per cent reporting operating losses. On a regional basis, in 1993 the operating result expressed as a percentage of operating revenues ranged from an operating profit of just under 3 per cent for the airlines in Africa to an operating loss of almost 3 per cent for those based in Latin America/Caribbean. Net results ranged from a surplus of just under 1 per cent of operating revenues for the airlines based in the Middle East to a net loss of about 9 per cent of operating revenues for those in Latin America/Caribbean (Figure 2-2).

2.113 In 1994, the United States scheduled airlines ("majors" and "nationals") as a group accounted for about 35 per cent of the total operating revenues of the scheduled airlines of ICAO Contracting States (excluding operations within the CIS). Preliminary data indicate that their operating result in 1994 was a profit of $2.8 billion, double the profit of $1.4 billion experienced in 1993. For the airlines of the rest of the world combined (excluding operations within the CIS), the preliminary estimated operating profit in 1994 is $5.2 billion compared with an operating profit of $0.9 billion shown for 1993.

2.114 Available financial data on non-scheduled carriers are insufficient to provide an accurate picture.



Source: ICAO Air Transport Reporting Form EF-1.

Figure 2-2. Financial results by region in 1993 — scheduled airlines

Consolidated Balance Sheet

2.115 At the end of the fiscal year 1993 (1994 data were not available at the time of writing), the total assets of the scheduled airlines of ICAO Contracting States (excluding operations within the CIS) stood at $277.8 billion compared with $266.6 billion at the end of the fiscal year 1992 (Table 2-15). Of these, some 25 per cent were represented by current assets, 61 per cent by fixed assets and the remainder by other assets.

2.116 At the end of 1993, the net value of the aircraft fleet (i.e. after depreciation charges) was $128.3 billion compared with $120.5 billion at the end of 1992, representing an increase of some 6 per cent, or from about 45 to 46 per cent of total assets. Accumulated depreciation charges stood at about $108.7 billion of which $82.4 billion were for the aircraft fleet, representing some 39 per cent of the gross value of the fleet. The remaining accumulated depreciation charges covered ground property and equipment and represented some 51 per cent of their gross value.

Table 2-15. Consolidated balance sheet
Scheduled airlines of ICAO Contracting States[1]
End of fiscal years 1985, 1992 and 1993

	1985		1992		1993	
	U.S.$ (million)	% of total	U.S.$ (million)	% of total	U.S.$ (million)	% of total
ASSETS						
Current assets	36 060	31	67 480	25	68 660	25
Fixed assets						
Flight equipment	54 340	48	120 540	45	128 330	46
Ground property and equipment	12 260	11	24 760	9	25 760	9
Land	420	0	2 110	1	2 340	1
Investments in affiliated companies	1 460	1	12 100	5	12 610	5
Other assets	10 540	9	39 610	15	40 140	14
TOTAL ASSETS	115 080	100	266 600	100	277 840	100
LIABILITIES						
Current liabilities						
Current liabilities	29 430	26	67 960	25	69 720	25
Unearned transportation revenues	8 480	7	15 030	6	14 390	5
Long/medium-term liabilities						
Long-term debt	40 070	35	93 110	35	104 220	38
Other medium/long-term liabilities	12 530	11	50 330	19	46 460	17
Stockholders' equity						
Share capital	9 900	9	19 780	7	23 110	8
Other capital	14 670	12	20 390	8	19 940	7
TOTAL LIABILITIES	115 080	100	266 600	100	277 840	100
ACCUMULATED DEPRECIATION						
Flight equipment	35 860	78	77 260	76	82 360	76
Ground property and equipment	10 190	22	24 800	24	26 290	24
TOTAL ACCUMULATED DEPRECIATION	46 050	100	102 060	100	108 650	100

1. Excludes domestic operations within the CIS.

Source: ICAO Air Transport Reporting Form EF-1.

2.117 Between the end of fiscal year 1992 and 1993, stockholders' equity increased some 7 per cent (from $40.2 billion to $43.1 billion), but in relative terms it remained at 15 per cent of total liabilities. During the same period long-term debt increased from $93.1 billion to $104.2 billion, i.e. from 35 per cent to 38 per cent of total liabilities. At the end of fiscal year 1993 current liabilities, including unearned transportation revenue, stood at $84.1 billion, or some 30 per cent of total liabilities, compared with some 31 per cent in 1992. Hence during 1993 the acquisition of fleet equipment and other investments appear to have been financed mainly through an increase in long-term debt. Unearned transportation revenue represented about 5 per cent of total liabilities and some 7 per cent of the total traffic revenue for 1993.

2.118 Long-term trends in the balance sheet elements may be discerned from comparing the figures for 1993 with those for 1985, which are also contained in Table 2-15. At the end of fiscal year 1993 total assets stood at $277.8 billion compared with $112.5 billion at the end of 1985. Relative to the totals, the most significant difference between 1985 and 1993 is the decrease in the proportion of current assets (from 31 to 25 per cent of the total) and the corresponding increase in other assets, largely due to the relative increase in deferred charges. The proportion of fixed assets is virtually the same in both years (about 60 per cent of total assets in both years); however there was a significant relative increase in investment in affiliated companies (from about 1 per cent of total assets in 1985 to some 5 per cent in 1993), and a reduction in the relative amount represented by flight equipment, and ground property and equipment.

2.119 As regards liabilities, between 1985 and 1993 there was a reduction in the proportion of current liabilities including unearned transportation revenue (from 33 to 30 per cent of total liabilities) and stockholders' equity (from 21 to 15 per cent) with a corresponding increase in long-term liabilities. The change in the latter was due to increases in long-term debt, in some reserves and in advances from affiliated companies. With regard to stockholders' equity, between 1985 and 1993 there was a small decrease in the proportion of share capital and a more significant relative decrease in the capital surplus in part due to the negative net balance of unappropriated retained earnings (i.e. cumulative losses) at the end of fiscal year 1993.

GENERAL AVIATION

2.120 General aviation is here defined as civil aviation other than scheduled and non-scheduled commercial air transport. On the basis of world-wide statistics for 1993 and available 1994 data for the States where general aviation activity is highly developed, it is possible to draw some over-all conclusions on the development of this branch of civil aviation in 1994. The number of civil aircraft on register in ICAO Contracting States which are operated by other than commercial air transport operators provides another indication of the volume of general aviation activity.

2.121 General aviation flying in ICAO Contracting States (excluding the CIS and China) is estimated to have decreased slightly in 1994 from the 1993 estimate of about 40 million hours, to about 39 million hours (Table 2-16). Of this total for 1994, an estimated 9 million hours (23 per cent) were flown in instructional flying, 21 million hours (54 per cent) in business

and pleasure flying and 9 million hours (23 per cent) in aerial work and other flying. The total of 39 million general aviation flying hours compares with a total of about 26 million hours flown on scheduled services by the airlines of the same Contracting States in 1994.

2.122 The number of civil aircraft on register in ICAO Contracting States (excluding the CIS and China), operated by other than commercial air transport operators and mostly utilized in general aviation activities, increased slightly from 337 550 at the end of 1992 to an estimated 338 820 at the end of 1993. During the same period, the number of fixed-wing aircraft also increased, from 322 630 to an estimated 323 530; the United States continued to account for about 75 per cent of such aircraft. The number of turbo-jet and turboprop aircraft increased relatively rapidly over the period but piston-engine aircraft remained by far the dominant category and single-engine types constituted 82 per cent of the total general aviation fleet at the end of 1993.

2.123 The number of valid private pilot licences at the end of 1994 in ICAO Contracting States (excluding the CIS and China) was estimated at about 558 000 compared with some 561 000 in 1993, an estimated decrease of about 1 per cent.

Table 2-16. Estimated number of hours flown in general aviation activities, 1993-1994
(excluding the CIS and China)

	Millions of hours	
Type of flying	1993	1994
Instructional	9.5	9.0
Business/pleasure	21.5	21.0
Aerial work/other	9.0	9.0
TOTAL	40.0	39.0

Source: ICAO survey on aviation activities.

Chapter 3
Airports and Air Navigation

3.1 This chapter discusses developments in 1994 in the management and organization of airports and air navigation facilities and services, in the infrastructure, traffic and financing of airports, and in technical aspects of air navigation services.

MANAGEMENT AND ORGANIZATION

3.2 The trend towards governments establishing autonomous authorities to operate airports and/or air navigation services continued in 1994, with increased attention being given to more active private involvement in airport operations and financing. Thus, in Denmark, 25 per cent of the government's 100 per cent holding in Copenhagen Airports A/S went on public sale in April with a further 24 per cent expected to follow at a later date. In Argentina, Terminal A at Ezeiza International Airport, Buenos Aires, was transferred to Aerolineas Argentinas as part of a move to encourage more active private involvement in airport operations and management, and the government was also studying the transfer of about 50 airports to local and foreign operators through concessions of 15 to 20 years. In Venezuela, proposed legislation would allow for new possibilities for private investment in airports, backed by a government guarantee for up to 75 per cent of the total project costs.

3.3 Particular emphasis appeared to be given to long-term leasing as compared with outright sale. For example, in Australia the government, while proceeding with its plan to sell 22 major airports operated by the Federal Airports Corporation (FAC), was now proposing to sell long-term leases of 50 years rather than the freehold titles originally proposed; moreover, a controlling interest would remain in Australian hands and the land would continue to be owned by the State. In Canada, the government unveiled a strategy which calls for "commercialization" of the 26 largest airports, including Toronto's Lester B. Pearson Airport; the federal government would retain ownership but would enter into long-term leases with newly created not-for-profit Canadian airport authorities (CAAs) structured along the same lines as the four existing local airport authorities (LAAs) with which it has already contracted to operate Vancouver, Edmonton, Calgary and Montreal (Dorval and Mirabel) airports. In Mexico, the government planned to transfer the management of 58 airports to the private sector through concessions of up to 50 years.

3.4 As to more "traditional" autonomous authorities, in India the International Airports Authority and the National Airports Authority were merged to form the Airports Authority of India. In Cameroon, the government handed over the management of seven major airports to the newly created company Aéroports du Cameroon (ADC).

3.5 The trend towards providing air navigation services through autonomous authorities also continued in 1994, but private involvement was not as actively pursued as it was in the case of airports. In Ireland, the Irish Aviation Authority, which is required to be self-funding, was established as a state-owned company; it took over the functions, assets and staff of the Air Navigation Services Office. In the United States, the administration proposed transferring its air traffic control functions to a new not-for-profit federal corporation, the U.S. Air Traffic Control Services Corporation (USATS), which would be responsible for operation, maintenance and development of air traffic control, while the Federal Aviation Administration (FAA) would oversee and regulate safety and security. In Austria, following organizational changes in the country's civil aviation federal office which took place in January 1994, all air traffic control activities became the responsibility of Austro Control GmbH, a limited company with up to 49 per cent of its shares available for purchase by local airport authorities and 51 per cent retained by the government.

3.6 In Canada, the government decided to pursue the transfer of the Canadian air navigation services (ANS) to a not-for-profit corporation, to be operated by a board of directors representing a wide range of stakeholders, including airlines, pilots and air traffic controllers. The system will be funded by users through charges; safety regulation, however, will remain the full responsibility of the government. In the United Kingdom, a plan to privatize the National Air Traffic Services (NATS) which had been agreed in principle in May 1994 was postponed on the grounds that more studies were required on the actual details.

MAJOR AIRPORT PROJECTS

3.7 There were 1 073 airports in the world at the end of 1994 serving international civil operations. During 1994, new international airports were opened at Osaka (Japan), Al Ain (Abu Dhabi, United Arab Emirates) and Sanya on Hainan Island (China). In the United States, inauguration of the new Denver International Airport was delayed until February 1995. Construction continued on a number of other new airports notably in the Asia/Pacific region, including Macau International, due to open in 1995; Chek Lap Kok in Hong Kong, due to open in 1997; Kuala Lumpur International (Malaysia), due to open in 1998; Seoul Metropolitan (Republic of Korea), also due to open in 1998; and the new Bangkok International (Thailand), due to open in the year 2000. In China, around 20 major airports are scheduled for completion by the turn of the century including Guangzhou International at Huadu, replacing Guangzhou Baiyun Airport; and Nanjig at Jiangsu. In Europe, the new Oslo Airport at Gardermoen (Norway) is to become operational by the end of 1998. In the Middle East, Dahran International (Saudi Arabia) is scheduled to open in 1995 and the new Doha International Airport (Qatar) is due to open in 1997. New international airports were also being planned for Athens (Greece), Berlin (Germany), and Praia (Cape Verde).

3.8 Major airport expansion projects were under way in all regions in 1994. Projects completed during the year included: a new airport complex comprising a new terminal and five-storey concourse in Brussels (Belgium); a second terminal at Frankfurt and the extension of the central terminal building at Düsseldorf (both in Germany); new passenger terminals for Santiago (Chile) and for Bahrain International Airport; a new international terminal for

Mexico City; a new domestic terminal at Calcutta (India) and a new terminal for Kiev/Borispol International (Ukraine). Work continued on rebuilding Beirut International (Lebanon). New terminals were under construction in Brisbane and Melbourne (both in Australia); Budapest — Ferihegy (Hungary); Fort de France (Martinique); and at Leipzig/Hall and Munster/Osnabrück (both in Germany). Construction commenced on a third runway at Stockholm — Arlanda (Sweden), with completion scheduled for 1999; and work on the new parallel runway for Sydney/Kingsford — Smith (Australia) continued. At New York's John F. Kennedy International Airport (United States), a consortium of four foreign airlines signed an agreement providing for the construction and operation by 1998 of a new passenger terminal for their use and possibly for use by other airlines as well. Development of new terminals were in advanced stages of planning for Larnaca (Cyprus), Cairo (Egypt), Ben Gurion (Israel), Manila (Philippines) and Dubai (United Arab Emirates). Major construction development projects, including new terminals, were started for San Francisco International (United States) and Port of Spain (Trinidad and Tobago).

AIRPORT TRAFFIC

3.9 The 25 largest airports in the world in terms of passenger throughput, 17 of which are located in the United States, handled a combined total of about 834 million passengers in 1994 (Table 3-1). This represents about 30 per cent of the world total of scheduled and non-scheduled passengers or an average per airport of some 91 thousand passengers every twenty-four hours. These 25 airports also handled a combined total of about 10 million aircraft movements in 1994, corresponding to an average per airport of one take-off or landing every one minute and eighteen seconds.

3.10 There are significant differences between the rankings of airports by passengers and by movements. For example, Tokyo-Haneda ranks sixth in terms of passengers handled but forty-eighth in terms of aircraft movements, Frankfurt seventh by passengers but seventeenth by movements, and Hong Kong nineteenth by passengers but sixty-fifth by movements, illustrating that a substantial part of traffic at these airports was carried on wide-body aircraft. Airports which do not make the listing by passengers but which would make a top 25 listing by movements are Pittsburgh (14), Charlotte (16), Washington-National (18), Philadelphia (20), Seattle (21) and New York-La Guardia (24).

3.11 Table 3-1 also includes 1985 data to illustrate the longer-term rate of growth of airport traffic. Passengers handled at the large airports concerned increased at about 5 per cent per annum on average over the 1985-1994 period, while aircraft movements increased at about 3 per cent per annum, illustrating a trend to the use of larger aircraft. There were substantial differences in the rates of growth amongst individual airports.

3.12 Table 3-2 lists the 25 largest airports in the world in terms of *international* passengers handled. In marked contrast to Table 3-1, only 3 of the 25 airports are located in the United States. The 25 airports together, representing less than 2.5 per cent of airports serving international operations, handled about 401 million passengers in 1994, or almost 50 per cent of the world total of international scheduled and non-scheduled passengers.

Table 3-1. Scheduled and non-scheduled traffic at world's major airports
(top 25 airports ranked by TOTAL passengers, 1994).

Rank No.	Airport (ranking by total commercial aircraft movements given in brackets)	Passengers embarked and disembarked				Aircraft movements			
		1994 (thousands)	1993 (thousands)	Change 1994/93 (%)	Average change per annum 1994/85 (%)	1994 (thousands)	1993 (thousands)	Change 1994/93 (%)	Average change per annum 1994/85 (%)
1	Chicago (2)	66 468	65 091	2.1	3.6	806.7	814.4	–0.9	1.4
2	Atlanta (4)	53 630	47 751	12.3	2.6	533.4	487.1	9.5	–3.2
3	Dallas/Ft. Worth (1)	52 601	49 655	5.9	4.0	826.2	789.0	4.7	5.0
4	London-Heathrow (11)	51 362	47 601	7.9	5.7	409.4	396.0	3.4	4.0
5	Los Angeles (3)	51 050	47 845	6.7	3.4	632.6	620.6	1.9	3.3
6	Tokyo-Haneda (48)	42 206	41 562	1.5	5.0	193.4	189.0	2.3	2.4
7	Frankfurt (17)	34 473	31 767	8.5	6.5	357.6	333.0	7.4	5.6
8	San Francisco (13)	33 965	32 042	6.0	3.5	394.6	391.2	0.9	1.5
9	Denver (5)	33 133	32 623	1.6	1.7	499.6	524.4	–4.7	1.5
10	Miami (6)	30 203	28 660	5.4	4.8	480.4	457.0	5.1	6.1
11	Paris-Charles de Gaulle (25)	29 313	25 695	14.1	8.0	318.7	303.4	5.0	9.6
12	New York-Kennedy (22)	28 807	26 797	7.5	–0.1	327.0	316.8	3.2	2.8
13	New York-Newark (10)	28 020	25 809	8.6	–0.2	415.4	417.2	–0.4	2.2
14	Las Vegas (19)	26 850	22 492	19.4	10.7	345.9	316.9	9.2	6.5
15	Seoul (58)	26 828	22 991	16.7	17.1	178.9	165.3	8.2	14.9
16	Detroit (9)	26 801	24 171	10.9	6.2	416.5	396.7	5.0	3.3
17	Paris-Orly (40)	26 497	25 288	4.8	4.6	209.0	204.7	2.1	3.4
18	Phoenix (15)	25 626	23 555	8.8	9.2	383.2	373.1	2.7	4.4
19	Hong Kong (65)	25 248	24 421	3.4	11.0	140.8	135.5	3.9	9.9
20	Boston (7)	25 195	24 038	4.8	2.3	445.9	477.5	–6.6	2.8
21	Minneapolis (12)	24 472	23 402	4.6	9.4	401.4	387.9	3.5	4.9
22	St. Louis (8)	23 363	19 924	17.3	3.3	433.7	398.8	8.8	2.0
23	Amsterdam (30)	23 069	20 770	11.1	3.7	274.1	259.7	5.5	1.2
24	Houston (23)	22 457	20 203	11.2	5.2	320.5	302.2	6.1	2.5
25	Orlando (26)	22 392	21 466	4.3	9.3	299.8	300.4	–0.2	6.4
	TOTAL	834 029	775 619	7.5	4.7	10 044.7	9 757.8	2.9	3.2

Source: ICAO Air Transport Reporting Form I and Airports Council International.

Table 3-2. Scheduled and non-scheduled traffic at world's major airports
(top 25 airports ranked by INTERNATIONAL passengers, 1994)

Rank No.	Airport (ranking by international commercial aircraft movements given in brackets)	International passengers embarked and disembarked				International aircraft movements			
		1994 (thousands)	1993 (thousands)	Change 1994/93 (%)	Average change per annum 1994/85 (%)	1994[1] (thousands)	1993 (thousands)	Change 1994/93 (%)	Average change per annum 1994/85 (%)
1	London-Heathrow (1)	44 251	40 848	8.3	6.1	332.1	319.6	3.9	5.4
2	Frankfurt (3)	27 639	25 119	10.0	7.5	268.0	257.9	3.9	6.4
3	Paris-Charles de Gaulle (2)	26 640	23 336	14.2	8.2	281.6	268.4	4.9	9.2
4	Hong Kong (11)	25 248	24 421	3.4	11.0	141.0	135.2	4.3	10.0
5	Amsterdam-Schiphol (4)	22 943	20 658	11.1	8.2	265.4	251.6	5.5	6.9
6	Tokyo-Narita (13)	20 681	18 947	9.2	9.4	116.6	114.4	1.9	5.7
7	Singapore (10)	20 203	18 796	7.5	9.8	145.0	136.8	6.0	9.0
8	London-Gatwick (9)	19 419	18 656	4.1	4.0	149.4	144.2	3.6	2.8
9	New York-Kennedy (20)	15 898	14 821	7.3	–0.3	100.1	97.0	3.2	1.1
10	Bangkok (17)	13 747	12 789	7.5	10.9	103.0	97.8	5.3	9.6
11	Zurich (6)	13 111	12 255	7.0	4.7	181.8	175.7	3.5	5.2
12	Miami (8)	13 071	12 373	5.6	7.3	157.7	150.0	5.1	8.3
13	Los Angeles (26)	12 679	11 945	6.1	8.8	70.3	69.0	1.9	5.6
14	Manchester (19)	12 068	10 791	11.8	11.3	100.4	92.8	8.2	9.6
15	Seoul (30)	11 865	10 599	11.9	13.1	65.5	60.3	8.7	11.8
16	Toronto (12)	11 419	9 746	17.2	5.4	121.8	120.7	0.9	4.2
17	Brussels (5)	11 236	10 029	12.0	8.1	202.6	188.6	7.4	9.8
18	Paris-Orly (22)	11 144	10 137	9.9	4.6	82.3	80.5	2.2	3.2
19	Copenhagen (7)	11 091	9 610	15.4	4.5	170.4	165.0	3.3	4.8
20	Rome-Fiumicino (21)	11 086	10 263	8.0	4.9	104.6	101.0	3.6	4.2
21	Palma de Mallorca (32)	10 628	9 037	17.6	5.1	58.1	57.0	2.0	2.4
22	Dusseldorf (16)	10 346	9 619	7.6	6.5	105.6	100.0	5.6	7.5
23	Madrid (18)	8 898	8 600	3.5	6.2	101.3	97.6	3.8	7.2
24	Munich (15)	8 291	7 834	5.8	6.9	112.4	107.9	4.2	7.8
25	Vienna (14)	7 160	6 652	7.6	8.4	113.6	104.4	8.8	9.1
	TOTAL	400 762	367 881	8.9	7.0	3 650.6	3 493.4	4.5	6.5

1. Estimated values.

Source: ICAO Air Transport Reporting Form I and Airports Council International.

3.13 Over the 1985-1994 period the number of international passengers handled at these airports increased at about 7 per cent per annum and the number of international aircraft movements increased at about 6.5 per cent per annum. Over this period, the highest annual growth rates recorded in terms of individual passengers were in general for airports in the Asia/Pacific region (Seoul 13 per cent, Hong Kong and Bangkok each at 11 per cent, Singapore 10 per cent and Tokyo-Narita 9 per cent). Seoul also achieved the highest annual growth rate in terms of international aircraft movements (12 per cent, followed by Bangkok, Brussels, Hong Kong and Manchester each at 10 per cent, and Munich, Paris-Charles de Gaulle and Singapore each at 9 per cent).

AIRPORT FINANCES

3.14 The number of international airports with total revenues exceeding total expenses continued to increase. This applies mainly to the major international airports in Europe and North America as well as a number of airports with a high volume of traffic in other regions of the world. However, the majority of the 1 073 airports listed in the ICAO regional air navigation plans probably still operate at a loss. The main reasons continue to be, *inter alia*, relatively high capital costs, low traffic volume and the need to keep charges on aircraft operators at reasonable levels.

3.15 There was no significant increase in the share which landing and associated airport charges represent in total airline operating expenses. That share was 4.1 per cent in 1993 compared to 4.0 per cent recorded in 1992.

AIR NAVIGATION FACILITIES AND SERVICES

3.16 In 1993 the share which route facility charges represent in total airline operating expenses increased to 2.4 per cent from 2.1 per cent in 1992. This is a reflection of both an increase in the number of States levying route facility charges and the growing emphasis by States in general to reduce their deficit in providing air navigation services.

3.17 Major developments during the year in the fields of aeronautical communications, navigation and surveillance, air traffic services, search and rescue, and aeronautical meteorology are described below.

Communications, Navigation and Surveillance

3.18 The introduction of the ICAO satellite-based Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) systems represents a significant departure from the present line-of-sight air navigation systems and as such requires unprecedented co-operative effort between civil aviation administrations, international organizations, service providers and users.

3.19 During the year ICAO continued to study how to assist States in the timely cost-effective implementation of the CNS/ATM systems in support of the future global air traffic management system as outlined in the CNS/ATM global plan. It also produced both a draft agreement for the immediate future between ICAO and the provider(s) of the global navigation satellite systems (GNSS) signal regarding the provision of signals for GNSS services, and a checklist of items to be considered in contracts for GNSS signal provision in the context of long-term GNSS.

3.20 The aeronautical community holds the view that the aeronautical telecommunication network (ATN) will provide the data communications infrastructure required to support the future ICAO CNS/ATM systems. The impact of the ATN transition will affect virtually every existing ground network, air-ground network and end system involved in aeronautical data communications; clear, practical technical provisions and plans will therefore be necessary to ensure a smooth transition to the ATN. In 1994 ICAO initiated the development of Standards and Recommended Practices (SARPs) for the ATN and other material required for the introduction of ATN.

3.21 Significant progress continued in a number of States and international organizations in the development and implementation of GNSS. A number of States continued development of a wide area augmentation system (WAAS), which will initially use the Inmarsat-3 satellites to be launched in 1995-1996. Several potential architectures for local area differential GNSS (DGNSS) continue to be developed and tested. Following the declaration of the initial operating capability of the global positioning system (GPS), a GNSS component, it was approved for instrument flight rules (IFR) supplemental use in the United States on 17 February 1994. In April, Fiji became the first State in the world to implement GPS as the primary navaid for en-route and terminal operations. On 26 October, the ICAO Council accepted the offer of the Government of the United States for use of the standard positioning service (SPS) of the GPS by the international community. Development and implementation of the global orbiting navigation satellite system (GLONASS), another potential GNSS component, continued with full deployment scheduled for 1995.

3.22 During the year considerable progress continued to be made in improving surveillance capabilities, including development of automatic dependent surveillance (ADS) and implementation of new radar systems. In Singapore an advanced automated air traffic control system, the Long Range Radar and Display System II (LORADS II), entered its final phase of testing. The system, based on the ICAO CNS/ATM concept, incorporates aeronautical satellite technology such as ADS. Tests of the LORADS II system were expected to be completed in 1995.

3.23 Also in 1994 a number of States continued to evaluate operational information on an airborne collision avoidance system with vertical resolution capability (ACAS II).

Air Traffic Management

3.24 Air traffic control systems around the world are being updated as part of the evolutionary process leading to a future global air traffic management system, which will include satellite-based automatic dependent surveillance systems to complement current radar equipment.

3.25 During 1994, many States developed short- and medium-term programmes and ordered equipment to update their ATC systems within the near future. Modernization of systems was achieved through introduction of new surveillance radar equipment, including monopulse and Mode-S secondary surveillance radar (SSR), multi-radar tracking systems and raster scan colour displays, new flight plan data processing systems and ATC simulators, as well as improved communications.

3.26 In areas where the implementation of radar service is not possible or practicable, it is envisaged that implementation of automatic dependent surveillance (ADS) will provide air traffic control with surveillance and intervention capability similar to that achieved through radar. Operational requirements have been established to ensure an orderly and co-ordinated development of ADS-based systems.

3.27 ADS is an integral part of the ICAO CNS/ATM systems concept. Considerable progress has already been achieved by ICAO, States and international organizations in the development of ADS systems. Airborne ADS capabilities, combined with data link communications and the global positioning system (GPS), are planned for implementation by 1995 in the South Pacific region and other airspaces of the world. Air traffic control (ATC) improvements and operational procedures are being developed to support the integration of those airborne and ground ATC systems components. In this context, the Airways Corporation of New Zealand was one of the first agencies to order an Oceanic Control System (OCS) as part of its CNS/ATM implementation plan. OCS is a satellite technology system that enables air traffic controllers to track aircraft within their oceanic airspace on a visual situation display, in effect providing an ocean-wide pseudo-radar system. Using on-board navigation systems, including a GPS, aircraft will be able to provide extremely accurate position data to ATC. Using a separate satellite, this position information will be transmitted to ATC air situation display screens.

3.28 The concept of required navigation performance (RNP) has been developed as another cornerstone of the ICAO CNS/ATM systems. The implementation of RNP, together with the progressive introduction of RNAV techniques in compliance with RNP requirements, is anticipated to support a more efficient utilization of the available airspace. It is envisaged that satellite-based navigation systems, in combination with airborne navigation systems, will meet any future navigation performance requirements, at least for en-route purposes.

Aeronautical Information Services

3.29 The absence of international standards concerning aeronautical data bases has created problems for data base producers and users. In 1994, ICAO adopted a restructured format for the Aeronautical Information Publication (AIP) which allowed for standardized storage of permanent aeronautical information in data bases and for AIP production. An important part of the information stored in electronic data bases is copied directly to the flight management system (FMS) computers on board the aircraft. The aeronautical data quality may have direct impact on air navigation; this will increase with the introduction of precision area

navigation (PRNAV) operations in Europe in 1998. In this respect ICAO is to develop SARPs and guidance material related to the quality of aeronautical data as well as Standards related to data transfer.

Aeronautical Meteorology

3.30 Many States continued in 1994 to install automated weather observing systems to support human observers.

3.31 A tendency towards the centralization of meteorological forecast services continued in 1994, and in a number of States the meteorological services were "commercialized" to varying degrees.

3.32 Developments have accelerated towards computer preparation by the world area forecast centres (WAFCs) of global forecasts of significant weather. As a result, the significant weather (SIGWX) charts for Europe, Middle East and North Atlantic regions are currently prepared in WAFC London by means of an interactive computer workstation. The capability to prepare such SIGWX charts with global coverage is expected to be achieved in this centre by the end of 1995. In preparing their aviation forecasts, both the London and Washington WAFCs benefit from the increasing number of air-reports sent automatically through air/ground data link. During 1994 the service providers for the world area forecast system (WAFS) satellite broadcasts were selected by both WAFCs, and it is expected that two broadcasts to cover the Caribbean, North America, South America, Africa, the western part of Asia, Europe and the Middle East will be implemented early in 1995. The third broadcast covering the Pacific and the eastern part of Asia will be implemented late in 1995 to complete the global coverage by WAFS satellite broadcasts.

3.33 The installation of terminal Doppler weather radar at key aerodromes in the United States continued during the year. Doppler radar's remote-sensing capability and highly sophisticated signal processing techniques permit it to detect wind shear, including microbursts, in the terminal area. Work is continuing on the development of an "add-on" wind shear processing capability for the Doppler radars used by air traffic control or airport surveillance. Towards the end of the year, a forward-looking airborne wind shear warning system based on Doppler radar technology was certificated in the United States and other systems continued in the certification process.

3.34 The volcanic ash forecast transport and deposition (VAFTAD) computer model was applied by the United States to the tracking of ash clouds from volcanic eruptions in the Asia and Pacific regions. The VAFTAD forecast product is a four-panel chart intended for use by pilots, operators and air traffic controllers showing relative ash concentrations through four different layers of the atmosphere.

3.35 The 12-month experience reported by States and users from the use of the new aeronautical meteorological codes (METAR, SPECI and TAF), introduced world-wide on 1 July 1993, was generally positive.

Search and Rescue

3.36 The satellite-based COSPAS-SARSAT[1] system continued to play an important role in 1994 in detecting emergency locator transmitters (ELTs) and in locating aviation distress sites.

3.37 The system also continued to expand its capability. There were 6 satellites in operation and several replacement satellites incorporating technical enhancements were being built. The ground system of local user terminals (LUTs) and mission control centres (MCCs) was improved and expanded. At year end, 30 LUTs and 17 MCCs were in operation or under test. Although global coverage was already provided on 406 MHz, additional LUTs and MCCs were planned to increase the real-time coverage of the system and reduce over-all response time.

3.38 Since it began trial operations in September 1982, the COSPAS-SARSAT system has contributed to the rescue of over 4 500 persons in aeronautical, maritime and terrestrial incidents.

1. COSPAS — space system for search of vessels in distress;
SARSAT — search and rescue satellite-aided tracking.

Chapter 4
User and Public Interest

4.1 This chapter reviews the levels of safety and security in air transport in 1994, efforts during the year to further facilitate the flow of passengers and cargo at airports, and air transport aspects of the broader social issues of environmental protection and of smoking restrictions.

SAFETY

Scheduled Operations

4.2 Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services for ICAO Contracting States shows that there were 28 fatal aircraft accidents in 1994 involving 941 passenger fatalities compared to 34 fatal accidents and 936 passenger fatalities in 1993 (Table A1-3 in Appendix 1). Relating passenger fatalities to the volume of traffic, the number of passenger fatalities per 100 million passenger-kilometres in 1994 remained at 0.05, the same as in 1993 (Figure 4-1). Excluding the Commonwealth of Independent States (CIS, for which the relevant data were not available), the number of fatal aircraft accidents per 100 000 aircraft-kilometres flown decreased to 0.14 in 1994 from 0.19 in 1993 (Figure 4-2), and the number of fatal aircraft accidents per 100 000 landings also decreased to 0.15 in 1994 from the previous rate of 0.21 in 1993 (Figure 4-3).

4.3 The safety levels are significantly different for the various types of aircraft operated on scheduled passenger services. For instance, in turbo-jet aircraft operations, which account for about 95 per cent of the total volume of scheduled traffic (i.e. in terms of passenger-kilometres performed), there were 11 accidents in 1994 with 729 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 5 per cent of the scheduled traffic volume, there were 17 accidents with 212 passenger fatalities. The fatality rate for turbo-jet aircraft operations was, therefore, far lower than for propeller-driven aircraft.

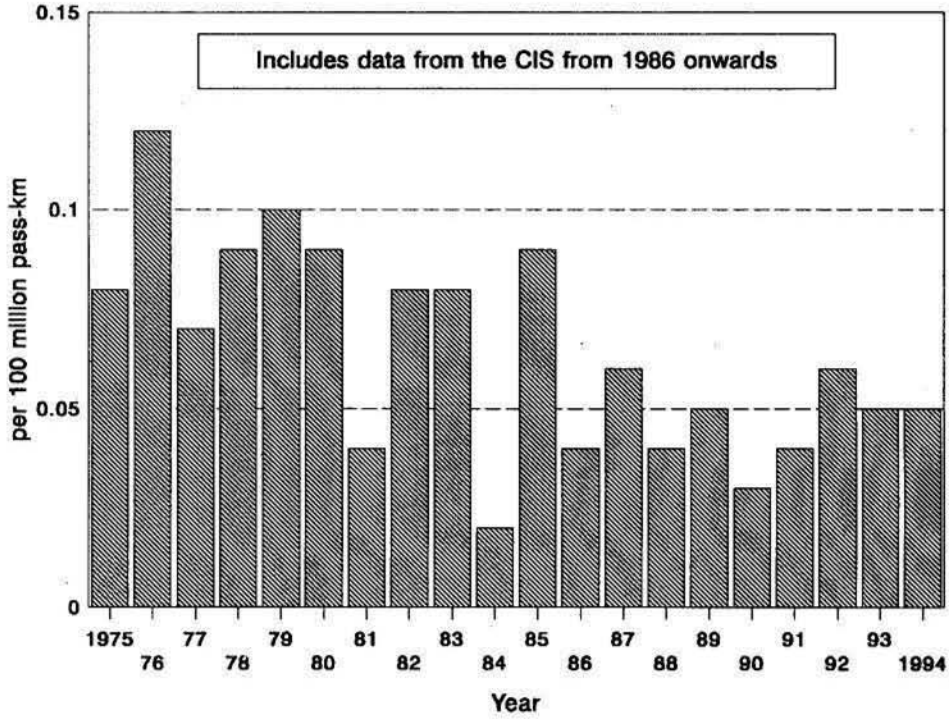
Non-Scheduled Commercial Operations

4.4 Non-scheduled commercial operations include both the non-scheduled flights of scheduled airlines and all air transport flights of non-scheduled commercial operators. Data available to ICAO on the safety of non-scheduled passenger operations show that in 1994 there were 54 fatal accidents with 251 passenger fatalities.

4.5 In non-scheduled operations performed with aircraft of more than 9 000 kg take-off mass, whether by scheduled airlines or non-scheduled operators, there were 5 fatal accidents with 33 passenger fatalities in 1994.

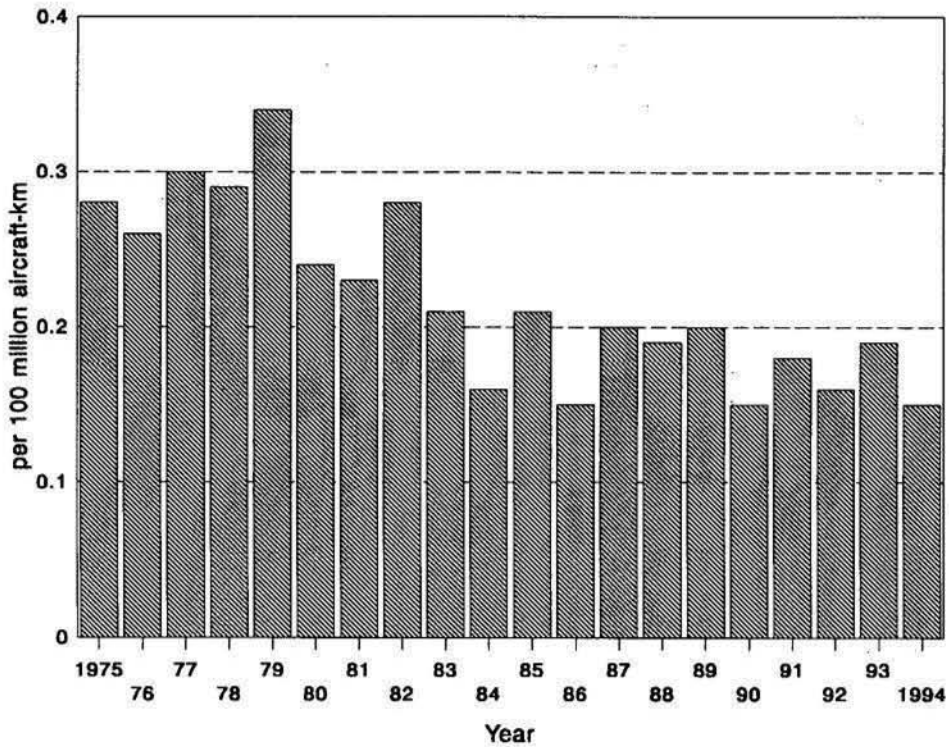
General Aviation

4.6 Complete statistical information is not available on safety in general aviation operations. In 1993, it is estimated that general aviation aircraft were involved in about 750 fatal accidents and that the number of fatalities in these accidents was about 1 550. The number of fatal accidents per 100 000 aircraft hours flown was about 1.88 in 1993. In the United States, which accounts for about 60 per cent of all reported general aviation activities in the world, there were 392 fatal accidents in 1994 resulting in 706 fatalities, according to preliminary information. The corresponding numbers for 1993 were 399 fatal accidents and 737 fatalities. For the United States, the rate of fatal general aviation accidents per 100 000 aircraft hours flown was about 1.87 in 1994, compared to 1.78 in 1993.



Source: ICAO Air Transport Reporting Form G and other reports.

Figure 4-1. Number of passengers killed per 100 million passenger-kilometres on scheduled services



Note.— Excludes data from the CIS as some information was not available.

Source: ICAO Air Transport Reporting Form G and other reports.

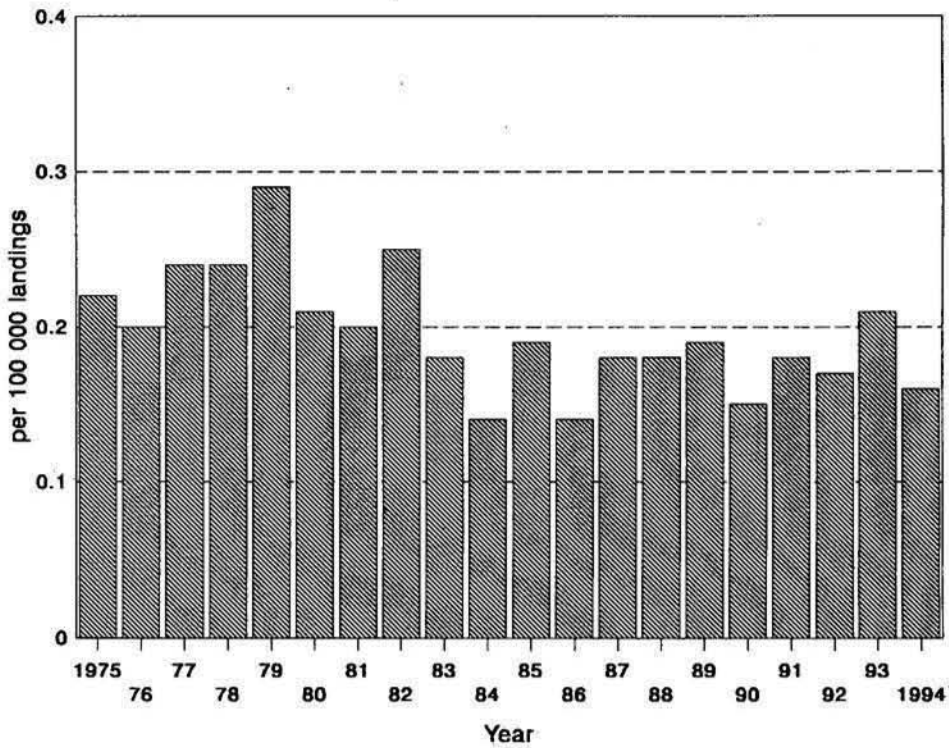
Figure 4-2. Number of fatal accidents per 100 million aircraft-kilometres flown on scheduled services

Safety Oversight

4.7 Following safety audits in 30 countries, in 1994 the United States' Federal Aviation Administration (FAA) banned airlines of nine Latin American and African countries from flying to the United States on grounds of inadequate safety oversight. Airlines from four other Latin American countries were granted conditional acceptance subject to further scrutiny by the FAA.

4.8 Also in 1994, the International Air Carrier Association (IACA) appealed to the European Union to curb, on the grounds of aviation safety, the growing influx of low-cost flag-of-convenience charter operators flying older aircraft registered in other regions of the world where government safety oversight was felt to be less stringent.

4.9 In 1992, the ICAO Assembly adopted Resolution A29-13 — Improvement of Safety Oversight, which recognized that the ICAO international safety standards require effective government oversight for their implementation. Through the Resolution, ICAO Contracting States reaffirmed their responsibilities and obligations for safety oversight. In October 1994,



Note.— Excludes data from the CIS as some information was not available.

Source: ICAO Air Transport Reporting Form G and other reports.

Figure 4-3. Number of fatal accidents per 100 000 landings by aircraft on scheduled services

the ICAO Council agreed to establish an ICAO safety oversight programme incorporating, as its core function, safety oversight assessments of States on a voluntary basis by ICAO teams with the objective of identifying deficiencies and providing relevant advice and assistance in addressing these deficiencies, as necessary, to enable States to implement the relevant ICAO Standards and Recommended Practices (SARPs).

SECURITY

4.10 In 1994, there were thirty-one acts of unlawful interference, which represent an increase when compared with twenty-nine in 1993. Nineteen of the incidents were classified as unlawful seizures, three were attempted seizures, two were acts of sabotage, two constituted in-flight attacks, four were attacks on a ground facility and one was an unlawful act against the safety of civil aviation. These acts of unlawful interference resulted in the deaths of twenty-nine persons and injuries to fifty-three persons. Developments in acts of unlawful interference since 1975 are shown in Figures 4-4 to 4-6 and in Appendix 1, Table A1-4.

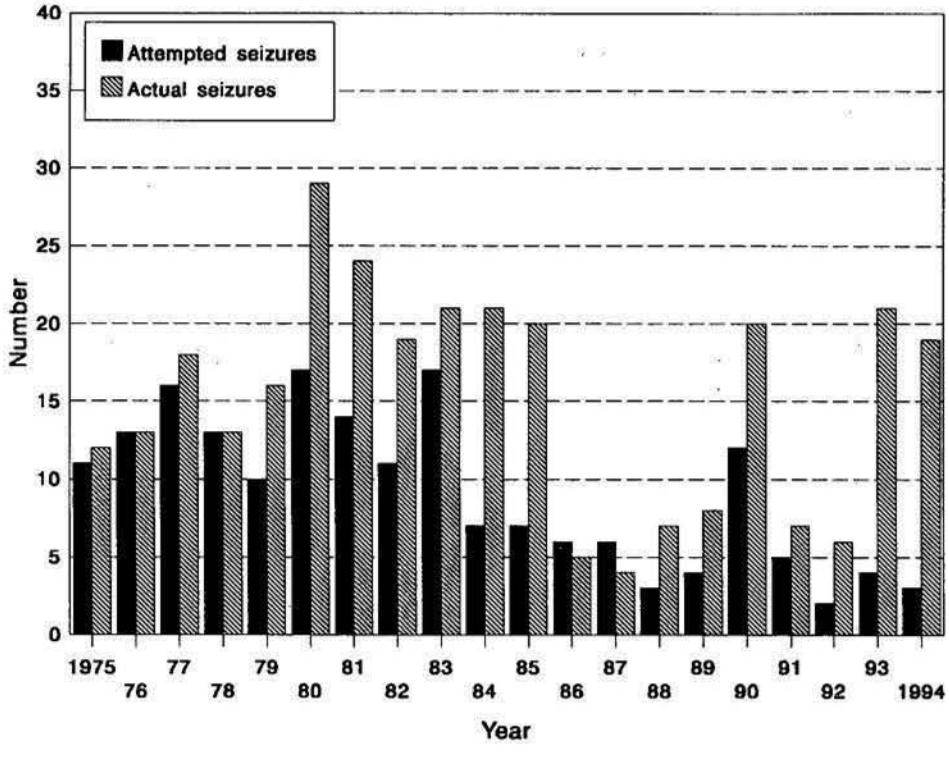


Figure 4-4. Acts of unlawful seizure

4.11 The ICAO Mechanism for financial, technical and material assistance to States with regard to aviation security continued to enhance global implementation of the aviation security system. Since the commencement of the Mechanism activities in 1989, 109 States have requested assistance; of these, 67 received technical evaluation missions and 23 have been the subject of follow-up missions. Arising from findings under the Mechanism and in recognition of the importance of the human element in the safeguarding of international civil aviation against acts of unlawful interference, ICAO is developing under this programme its Training Programme for Aviation Security which comprises a series of Standardized Training Packages (STPs), designed for global application. The purpose of this initiative is to provide States with the necessary training tools that will in turn assist them in developing the components of their national aviation security training programme. In the development of this material, particular care is being taken to ensure standardization of aviation security training requirements by States at all levels of staff development.

4.12 In June the European Civil Aviation Conference (ECAC) adopted specifications for Explosive Detection Systems (EDS) and Explosive Device Detection Systems (EDDS). The specifications are compatible with the FAA standards and should be of great assistance to manufacturers of security equipment. Other measures designed to increase and harmonize security at European airports were also adopted.

FACILITATION

4.13 The purpose of facilitation is to ensure the free, expeditious and unimpeded passage of an aircraft and its occupants across international boundaries — in the words of the Convention on International Civil Aviation, "to prevent unnecessary delays to aircraft, crews, passengers and cargo, especially in the administration of the laws relating to immigration, quarantine customs and clearance". This can be achieved in two ways; first, by cutting red tape through reducing, simplifying and, where possible, eliminating border crossing formalities and, second, through automating whatever formalities cannot be dispensed with.

4.14 During 1994 there was continuing emphasis on automation as a means of streamlining the border processing operation. ICAO continued the evaluation begun in 1993 of technologies which could be used to accomplish machine verification of a traveller's identity by linking that person to his or her travel document and also machine verification of the authenticity of that document. From a preliminary review, it appeared that the development of world-wide standards for biometric identification and machine verification could be feasible, with the understanding that the fundamental stability of the current specifications would have to be maintained in order to protect the interests of States that had already invested in OCR (optical character recognition) technology on the basis of those specifications.

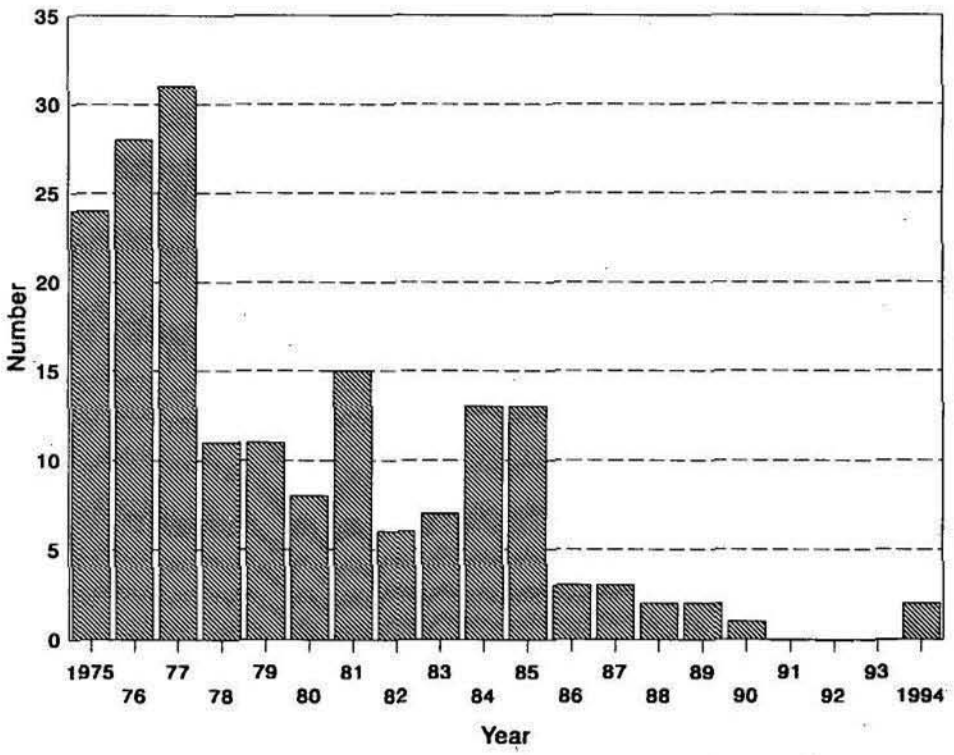


Figure 4-5. Incidents of sabotage

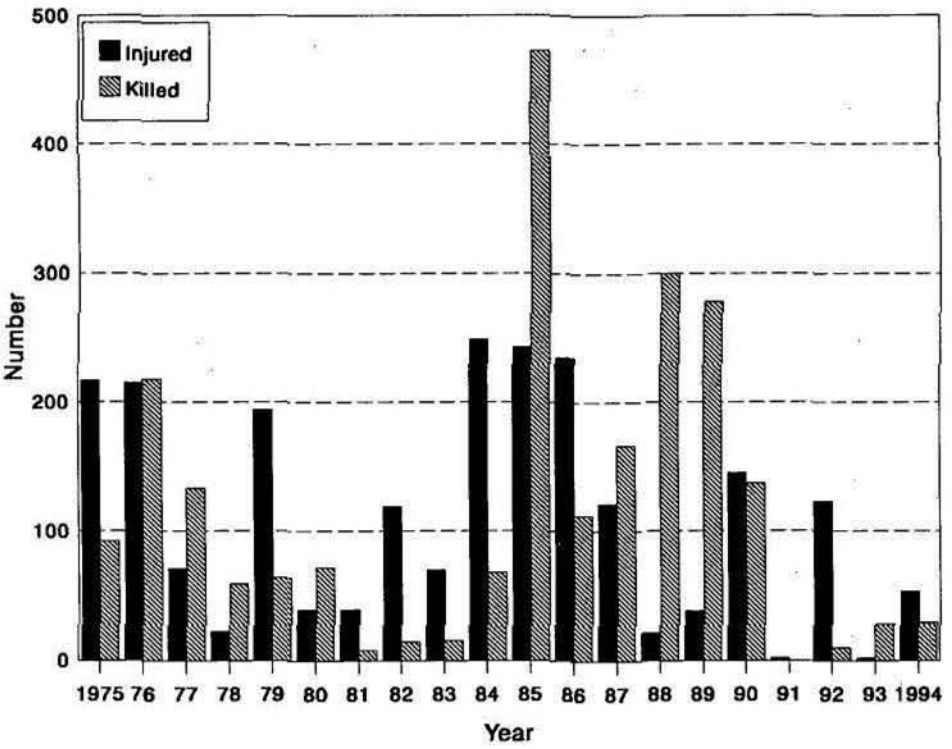


Figure 4-6. Number of persons killed or injured in acts of unlawful interference

4.15 The United States continued testing its automated clearance system, known as INSPASS, which utilizes hand geometry for biometric identification. An in-depth evaluation of this project was expected to be made available early in 1995. In the meantime, an informal grouping from the United States, Canada, Germany and the Kingdom of the Netherlands was looking into the possible development of other broader based pre-enrolment and automated inspection programmes, similar to INSPASS, but looking at the frequent flyer programmes of airlines as a potential source for enrolment data bases.

4.16 In the cargo field, automation continued to be an important issue. For example, at the end of 1993 the United States had enacted the Customs Modernization and Informed Compliance Act (commonly referred to as the "Mod Act") which made it possible for all the partners (customs, forwarders, express carriers and airlines) to operate in a totally electronic environment, removing the requirement for the person filing for clearance, the customs inspector and the cargo all to be in the same place at the same time. In 1994 the United States Customs Service began the process of developing the necessary regulatory and programming changes to make the Act operational.

4.17 The year 1994 was characterized by difficulties and delays in efforts begun in 1993 to harmonize border procedures for common areas. For example, elimination of immigration

controls planned for travel between the Schengen States (all the European Union States with the exception of Denmark, Ireland and the United Kingdom) was not achieved in 1994. However, a firm implementation date of 26 March 1995 was announced for the removal of immigration controls between seven of the Schengen States (Belgium, France, Germany, Netherlands (Kingdom of the), Luxembourg, Portugal and Spain), with physical controls to be in place for all airports involved except Schipol Airport, Amsterdam where there will be a "procedural solution". Australia and New Zealand continued to work towards an immigration preclearance system based on interactive computer linkages between the immigration authorities of the two countries.

ENVIRONMENTAL PROTECTION

4.18 In order to raise funds for the implementation of "Agenda 21", the action plan for all major areas affecting the relationship between the environment and development that was adopted in 1992 by the UN Conference on Environment and Development (UNCED), the UN system began to examine innovative financing mechanisms, including a possible tax on air travel.

4.19 The United Nations Framework Convention on Climate Change, which had been opened for signature at UNCED and has the objective of stabilizing greenhouse gas concentrations in the atmosphere at safe levels, entered into force in March. While the Convention has no specific provisions regarding civil aviation, it has led to increased interest in the environmental impact of aircraft engine emissions.

4.20 During 1994, the Intergovernmental Panel on Climate Change (IPCC), in its latest scientific assessment[1], concluded that the current aircraft fleet has a direct influence on global warming, although this is comparatively small. Aircraft contribute approximately three per cent of the total carbon dioxide (the principal greenhouse gas) from fossil fuel combustion. IPCC also indicated that while the effect of oxides of nitrogen emitted by aircraft on global warming is uncertain, it could be of similar magnitude — or smaller — than the effect of carbon dioxide from aircraft.

4.21 ICAO's Committee on Aviation Environmental Protection (CAEP) continued its review of the actions needed to control the effects of aircraft engine emissions around airports and in the upper atmosphere, taking account of the environmental need to control these emissions and the technical feasibility, safety and economic consequences of doing so. ICAO further developed its co-operative arrangements with those UN bodies responsible for preparing scientific assessment reports on climate change and on depletion of the ozone layer, and inventories of aircraft engine emissions are being made available to assist the scientific community in this work. An engine emissions data bank has been finalized, for publication in 1995.

1. Summary for Policymakers of the 1994 Working Group I Report on *Radiative Forcing of Climate Change*, Intergovernmental Panel on Climate Change.

4.22 Meanwhile, CAEP has also been considering to what extent further progress can be made in reducing aircraft noise in the long term, once States have implemented the phasing out of operations at noise-sensitive airports by Chapter 2 aircraft (subsonic jet aircraft that meet the noise certification levels in Annex 16, Volume I, Chapter 2, but not those in Chapter 3). Options under consideration include noise certification levels for new aircraft that would be more stringent than those in Chapter 3, new operational measures, and steps to promote further land-use planning around airports.

SMOKING RESTRICTIONS

4.23 A comprehensive study carried out by ICAO on the safety aspects of banning smoking on board passenger aircraft is to be submitted to the ICAO Assembly in 1995. The results of the study indicate that the flight safety risks, if indeed there are any, of restricting smoking progressively on all international passenger flights, with the objective of implementing complete smoking bans by 1 July 1996, do not warrant a reassessment of Resolution A29-15 adopted by the Assembly in 1992, nor a postponement of the adopted deadline. The report's final recommendation is to urge those States that have not yet done so to develop smoking ban implementation schedules as a matter of priority.

4.24 Meanwhile, during 1994, new steps were taken by States and airlines to outlaw smoking during flight. Australia, Canada and the United States signed a treaty to ban smoking on all flights of their carriers between the three countries effective 1 March 1995. Flights operated with an intermediate point in a country that had not signed the treaty and charter flights for which passengers did not pay individually were exempt. On 1 July 1994, Canada became the first country in the world to prohibit smoking on all domestic and international flights by its own commercial airlines. In the United States, legislation to ban smoking on all international (last inbound and first outbound sectors) and domestic flights for both United States and foreign carriers was advancing. During the year, six United States and two European air carriers requested the U.S. Department of Transportation for antitrust immunity to enable them to discuss a voluntary smoking ban on transatlantic flights. Such action, however, was opposed by the National Smokers Alliance on the basis that the airlines' joint action would deprive smokers of alternative choices and thus eliminate competition.

4.25 Actions by governments and airlines to restrict smoking also met resistance from pro-smoking groups elsewhere. In Europe, the British Freedom Organization for the Right to Enjoy Smoking Tobacco (FOREST) widely publicized the results of a survey on the right of people to smoke as they travel, emphasizing that several European airlines had removed smoking bans on commercial grounds. The survey, conducted on 233 flights from the United Kingdom to 95 international destinations and on 86 internal flights in 63 countries, concluded that while smoking was not allowed on 71 per cent of domestic flights, it was only banned on 22 per cent of the international flights.

PART II

WORLD OUTLOOK TO 1997

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Chapter 5
Global Trends and Forecasts

5.1 This chapter reviews developments in the world economy over the period since 1983 (and anticipated developments through to 1997), examines trends in airline traffic, productivity, prices and finances, and presents airline scheduled passenger traffic forecasts and, to the extent possible, airline financial forecasts, through to 1997.

ECONOMIC TRENDS

5.2 The demand for air passenger travel is primarily determined by income levels and demographics, and the cost of air travel. World energy demand, supply and prices are critically important both to economic progress and to the cost of travel. Hence, the airline industry is highly vulnerable to economic cycles and fluctuations in fuel prices.

5.3 Between 1983 and 1993, the aggregate world economy measured in terms of Gross Domestic Product (GDP) grew at an average annual rate of 2.6 per cent in real terms. Growth rates varied across regions, from a high of 5.2 per cent for Asia/Pacific to a low of 0.4 per cent for Europe (see Chapter 6 for details). World population growth between 1983 and 1993 increased at an average annual rate of 1.6 per cent. Hence, growth of the world's GDP per capita between 1983 and 1993 increased at an average annual rate of 1 per cent, significantly lower than the growth of GDP itself, as indicated in Figure 5-1.

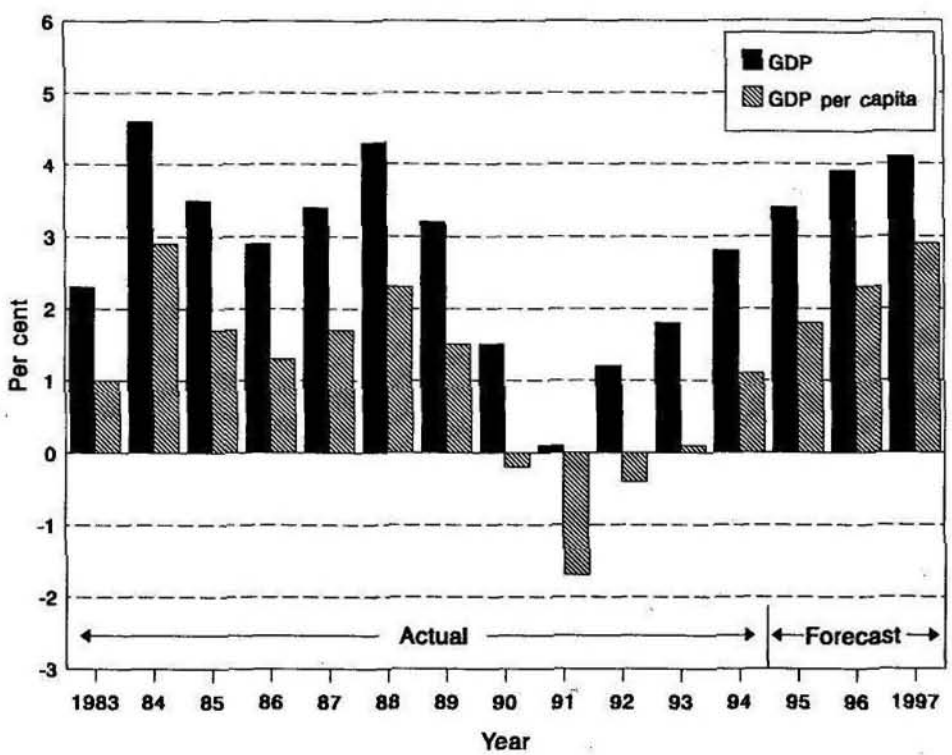
5.4 Following the recession of 1980 to 1982, the years 1983 to 1989 saw the world economy experience its longest period of sustained progress since World War II, achieving an average annual growth rate of 3.7 per cent. This extended period of growth in the world economy came to a halt during 1990. The economies of the United States, the United Kingdom and Canada entered into a recession, followed later by slow-downs in Germany and Japan. In addition, the former centrally planned economies of eastern Europe and the CIS (designated "countries-in-transition" by the International Monetary Fund) went into serious decline. As a result, the world economy was almost stationary in 1991, the most difficult year for the global economy since 1982, and was still quite weak in 1992 despite the commencement of recovery in North America. The world economy improved in 1993 and 1994 as the recovery became established in North America and eventually took hold in continental western Europe.

5.5 Developing countries as a group (excluding the "countries-in-transition") have generally maintained an annual growth of 4 to 6 per cent since the mid-1980s, despite the recent recession in the developed economies. Structural reform and the sustained implementation of prudent macro economic policies supported strong growth in the Asia/Pacific region and an

improved performance in Latin America. In the former region, strong domestic demand and rapid growth of regional trade helped to offset the weakness of export markets in industrialized countries. The past decade has been a disappointing one for Africa.

5.6 On several occasions in the last quarter century, sharp movements in crude oil prices have impacted powerfully on the world economy. In particular, the recessions of the mid-1970s and early 1980s were linked to the oil price increases of 1973 and 1979/80. Oil market conditions are therefore of great interest when assessing global economic performance. However, the capability of the economies of the industrialized countries to cope with the oil price increases has improved because of reduced energy dependency and the effects of structural reforms in the 1980s. Furthermore, world oil prices have settled into lower levels in recent years as markets have adjusted to shifts in supply and demand.

5.7 Oil price rises contributed to double digit inflation in the industrial countries in the 1970s and early 1980s. Since 1983, inflation has moderated to the 3 to 5 per cent range. Inflation rates have been high and variable in many developing countries and have tended to increase over the 1980s. The average annual rate for developing countries since 1983 has been around 50 per cent.



Source: IMF, Wharton Econometrics Services.

Figure 5-1. Annual change in real GDP and GDP per capita — World

5.8 There appears to be consensus amongst economic forecasters that the global economy will continue to expand over the medium term as recovery extends to Japan and conditions in the "countries-in-transition" improve in due course. The most recent International Monetary Fund (IMF) and Wharton Econometrics forecasts anticipate significant growth in world trade as well as in the GDP of most major economies. These assessments are taken into account in the global and regional economic forecasts presented in Table 5-1. World GDP is assumed to grow by 3.4 per cent in 1995 followed by growth rates of 3.9 and 4.1 per cent for the years 1996 and 1997. All regions are expected to participate in healthy growth over the forecast period, although Asia/Pacific is likely to continue to outperform the other regions.

AIRLINE TRAFFIC TRENDS

5.9 Total scheduled airline traffic, measured in terms of total tonne-kilometres performed, grew at an average annual rate of 5.5 per cent over the ten years between 1984 and 1994. Passenger-kilometres grew at an average rate of 5 per cent per annum and freight tonne-kilometres at nearly 7 per cent per annum.

5.10 Global traffic data for each year of the decade 1983-1994 are given in Tables 5-2 (total traffic) and 5-3 (international traffic).

5.11 In broad terms, the pattern of traffic growth over the 1983-1994 period was a reflection of economic conditions experienced over this period. As depicted in Figure 5-2, the relatively buoyant economic and air traffic performance during most of the 1980s came to an end in the middle of 1990. The economic recession in 1991 had a serious effect on air traffic.

Table 5-1. Economic growth (GDP) by region
(real average annual growth rates, per cent)

Region	Actual 1993	Estimated 1994	Forecast 1995	1996	1997
Africa	1.1	2.4	3.5	4.8	5.2
Asia/Pacific	3.7	4.3	5.5	5.7	6.0
Europe	–3.2	–2.1	1.8	3.4	3.5
Europe (excluding Eastern Europe and CIS)	–0.2	2.5	3.0	3.1	2.9
Middle East	3.8	2.3	4.0	5.0	5.0
North America	3.0	4.1	3.2	2.2	2.3
Latin America and Caribbean	3.3	4.6	3.0	4.0	5.0
World	1.8	2.8	3.4	3.9	4.1

Source: ICAO estimates based on World Bank, International Monetary Fund (IMF), Wharton Econometrics Services and other economic sources.

Table 5-2. World total international and domestic revenue traffic
(scheduled services of airlines of ICAO Contracting States, 1983-1994)

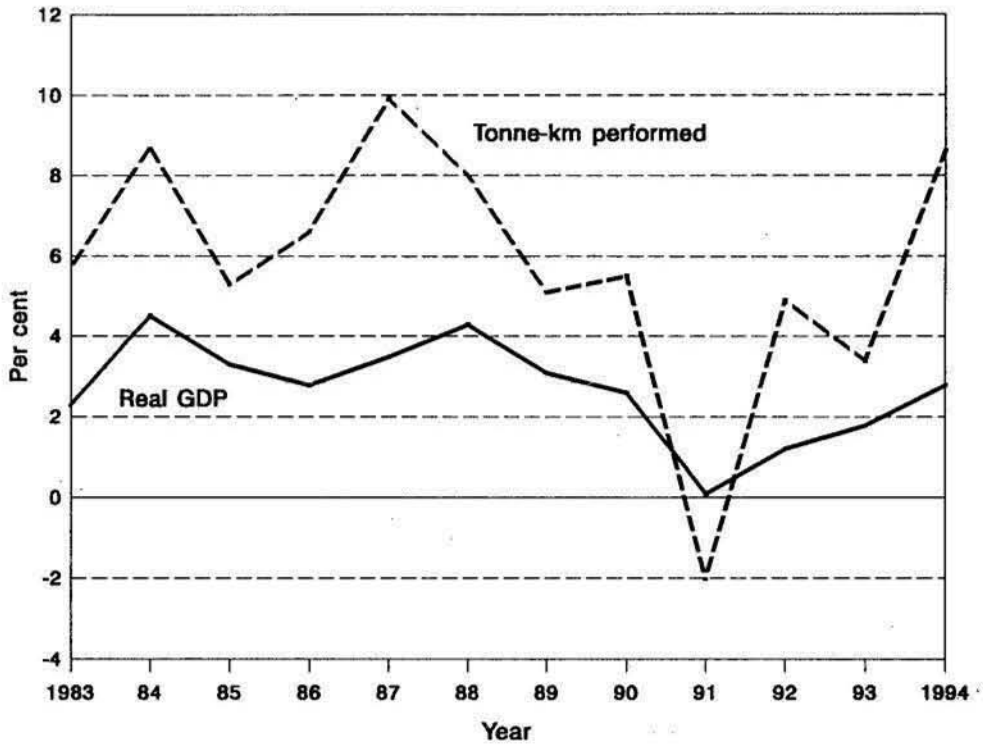
	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
Year	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1983	798	4.2	1 190 000	4.2	12.3	6.0	35 110	11.3	4 000	3.3	146 390	5.7
1984	848	6.3	1 278 000	7.4	13.4	8.9	39 670	13.0	4 310	7.8	159 200	8.7
1985	899	6.0	1 367 000	7.0	13.7	2.2	39 840	0.4	4 400	2.1	167 690	5.3
1986	960	6.8	1 452 000	6.2	14.7	6.9	43 190	8.4	4 540	3.2	178 800	6.6
1987	1 028	7.1	1 589 000	9.4	16.1	9.5	48 320	11.9	4 700	3.5	196 460	9.9
1988	1 082	5.3	1 705 000	7.3	17.2	6.8	53 270	10.2	4 830	2.8	212 110	8.0
1989	1 109	2.5	1 774 000	4.0	18.1	5.2	57 130	7.2	5 060	4.8	223 030	5.1
1990	1 165	5.0	1 894 000	6.8	18.3	1.1	58 820	3.0	5 330	5.3	235 250	5.5
1991	1 135	–2.6	1 844 000	–2.6	17.4	–4.9	58 570	–0.4	5 100	–4.3	230 610	–2.0
1992	1 148	1.1	1 927 000	4.5	17.3	–0.6	62 610	6.9	5 120	0.4	241 950	4.9
1993	1 141	–0.6	1 954 000	1.4	17.5	1.2	67 480	7.8	5 230	2.1	250 080	3.4
1994	1 203	5.4	2 086 000	6.8	20.0	14.3	76 530	13.4	5 470	4.6	271 500	8.6

Source: ICAO Air Transport Reporting Form A-1.

Table 5-3. World international revenue traffic
(scheduled services of airlines of ICAO Contracting States, 1983-1994)

	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
Year	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1983	173	1.8	511 000	2.8	5.1	8.5	25 200	11.5	1 700	6.3	73 780	5.6
1984	185	6.9	556 000	8.8	5.8	13.7	28 940	14.8	1 840	8.2	81 800	10.9
1985	194	4.9	590 000	6.1	5.9	1.7	29 380	1.5	1 860	1.1	85 600	4.6
1986	198	2.1	603 000	2.2	6.4	8.5	32 220	9.7	1 880	1.1	89 710	4.8
1987	222	12.1	688 000	14.1	7.2	12.5	36 700	13.9	1 940	3.2	101 970	13.7
1988	243	9.5	761 000	10.6	7.8	8.3	41 020	11.8	1 990	2.6	113 180	11.0
1989	262	7.8	824 000	8.3	8.6	10.3	44 930	9.5	2 080	4.5	123 060	8.7
1990	280	6.9	894 000	8.5	8.9	3.5	46 320	3.1	2 190	5.3	130 730	6.2
1991	267	–4.6	860 000	–3.8	8.5	–4.5	46 400	0.2	2 210	0.9	128 120	–2.0
1992	302	13.1	983 000	14.3	9.4	10.6	50 750	9.4	2 200	–0.5	143 600	12.1
1993	321	6.3	1 049 000	6.7	10.1	7.4	56 000	10.3	2 200	0.0	155 590	8.3
1994	340	5.9	1 136 000	8.3	11.2	10.9	64 090	14.4	2 260	2.7	171 680	10.3

Source: ICAO Air Transport Reporting Form A-1.



Source: IMF, ICAO Air Transport Reporting Form A-1.

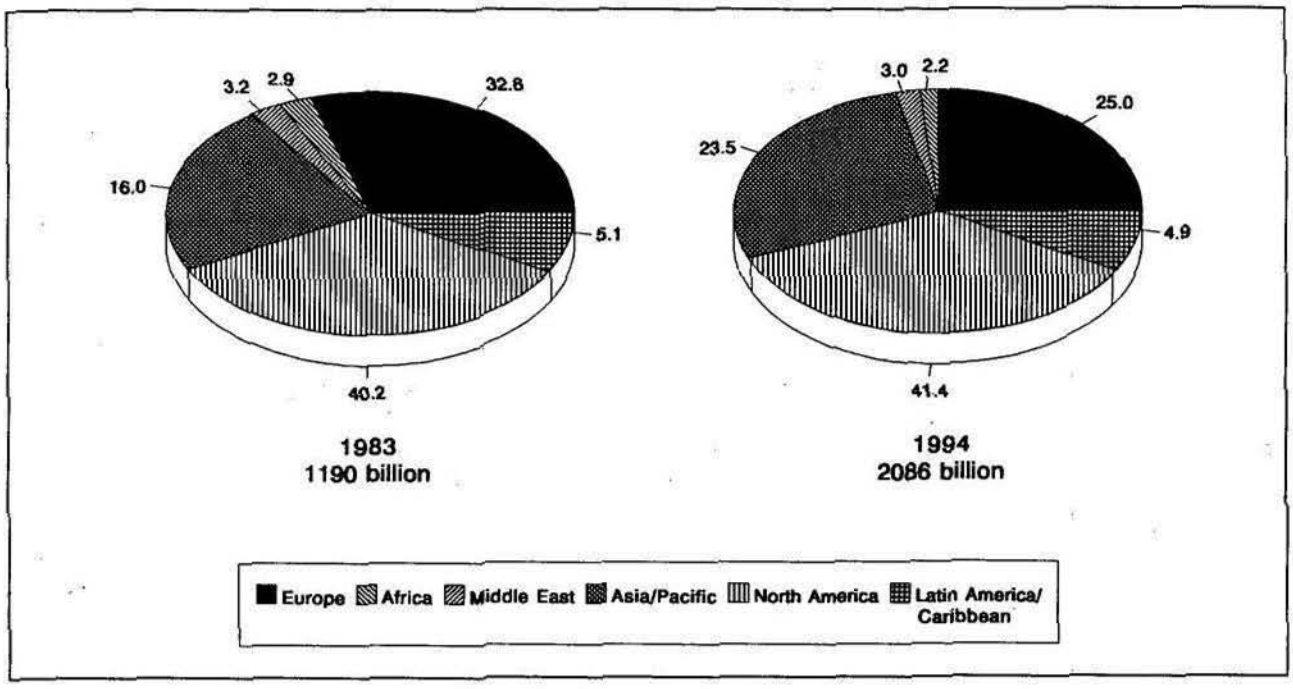
Figure 5-2. World GDP and scheduled traffic growth

The recovery in traffic in 1992, which occurred despite continuing poor economic performance, was achieved at a cost of significantly reduced revenue yield. Although real yields declined further in 1993 and 1994, the stimulating effect on traffic demand was less. On the other hand, economic growth began to provide a more solid foundation for traffic growth. This was particularly so in 1994 when total scheduled passenger traffic was estimated to have grown by 6.8 per cent.

5.12 The regional distribution of scheduled passenger traffic for the years 1983 and 1994 is illustrated in Figure 5-3. The airlines of the North American and European regions dominate, contributing 72.8 per cent of the total traffic in 1983 and 66.4 per cent in 1994. Passenger traffic performed by airlines registered in the Asia/Pacific region increased from 16 per cent of the total world traffic in 1983 to about 23.5 per cent in 1994. Other regions contributed 11.2 per cent of the traffic in 1983 and 10.1 per cent in 1994.

AIRLINE PRODUCTIVITY, PRICES AND FINANCIAL PERFORMANCE

5.13 The scheduled airline industry has a long history of improving productivity. As a result, the growth in the output of the industry (traffic volumes, conveniently measured by tonne-kilometres performed or TKP) has been greater than the growth in the various inputs

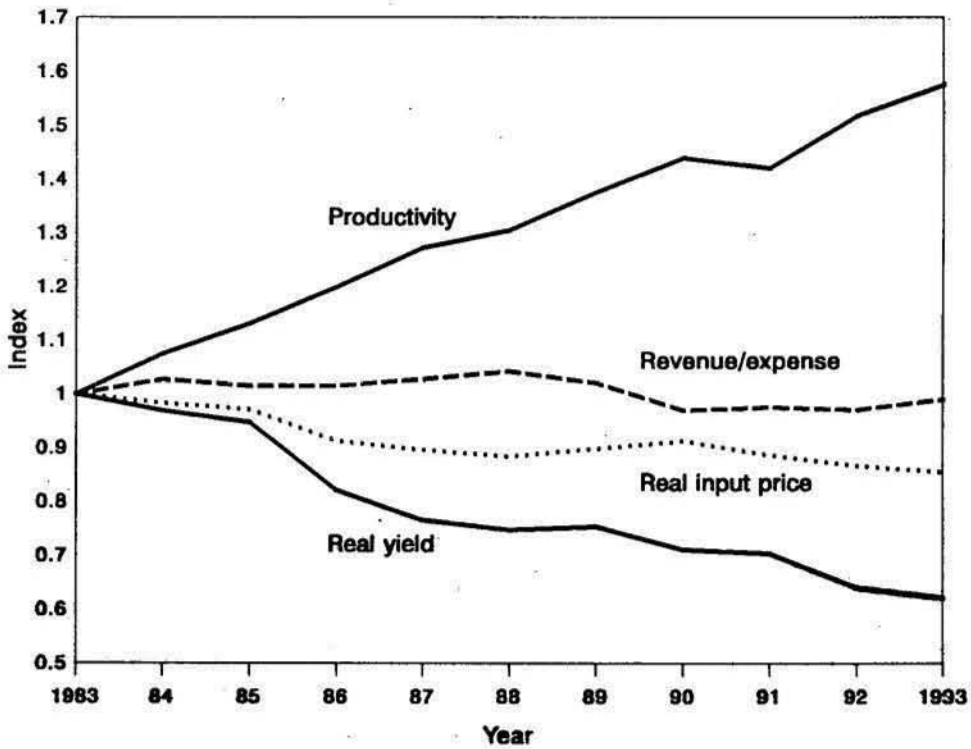


Source: ICAO Air Transport Reporting Form A-1.

Figure 5-3. Percentage regional distribution of scheduled passenger traffic — passenger-kilometres performed

used by the industry (mainly labour, fuel and aircraft). For the purposes of the present forecasts, separate partial productivity measures for labour (TKP per employee), fuel (TKP per tonne of fuel consumed) and aircraft (TKP per tonne of fleet payload) have been developed. The trend in total productivity, which is a combination of the partial productivities, is shown in Figure 5-4. The average annual growth in productivity since 1983 has been about 5 per cent. The progressive absorption of new technology aircraft into airline fleets has been a major reason for the improvement in productivity. In particular, the new aircraft are more fuel- and labour-efficient. Improved aircraft utilization and load factors have also made important contributions.

5.14 Improvements in productivity can, in principle, be used either to reduce the real fares and rates paid by passengers and shippers, or to pay for increases in real input prices (e.g. wage rates, fuel prices), or to provide airlines with improved financial results. The trends in airline yields and input prices, deflated by the Consumer Price Index of industrial countries, are presented in Figure 5-4, together with the trend in the revenue/expense (R/E) ratio representing the financial performance of the scheduled airline industry. Expenses are defined here as operating expenses, excluding taxes and interest on debt. It is clear that, over the past decade, airline customers have benefitted from lower real yields made possible by the combined impact of productivity growth and declines in the index of real input prices (primarily resulting from falls in fuel prices).



Source: IMF, ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 5-4. Trends in performance — scheduled airline industry

5.15 Although there has been neither an improvement nor a decline in the long-term trend in the financial performance of scheduled airlines as a whole, there have been relatively large changes in the operating results over the medium term. Table 5-4 shows the annual development over the past 10 years in operating revenues and expenses, the operating result (earnings before interest, other non-operating items and taxes) and the net result (after interest, other non-operating items and taxes). The growth in revenues and expenses over the period reflects an expansion in activity levels and general inflationary pressures, offset by improvements in the efficiency of the industry. However, the impact of these factors has varied considerably over the business cycle. During the buoyant years of the 1980s, rapid growth in demand resulted in a more intensive use of airline resources and strong productivity growth. Airlines were able to improve their operating results and also offer relatively low fares and rates to their customers. In the early 1990s, market conditions changed as demand weakened and the utilization of airline resources tended to decline. The emergence of excess capacity and consequent competitive pressures put downward pressure on yields. These factors combined to produce negative operating results in three consecutive years (1990-1992). In 1993, the airline industry started to move towards a more appropriate balance of supply and demand and achieved a small **operating** surplus. A much better operating result was obtained in 1994 (about $8 billion), although the **net** result still had not returned to surplus (according to preliminary estimates).

Table 5-4. Operating and net results[1]
(scheduled airlines of ICAO Contracting States)[2]

Year	Operating revenues U.S.$ (millions)	Operating expenses U.S.$ (millions)	Operating result Amount U.S.$ (millions)	Operating result Percentage of operating revenues	Net result[3] Amount U.S.$ (millions)	Net result[3] Percentage of operating revenues	Direct subsidies U.S.$ (millions)	Income taxes U.S.$ (millions)
1983	98 300	96 200	2 100	2.1	–700	–0.7	380	–340
1984	105 400	100 300	5 100	4.8	2 000	1.9	235	–1 100
1985	112 200	108 100	4 100	3.7	2 100	1.9	220	–660
1986	124 600	120 000	4 600	3.7	1 500	1.2	280	–1 100
1987	147 000	139 800	7 200	4.9	2 500	1.7	290	–1 650
1988	166 200	156 000	10 200	6.1	5 000	3.0	340	–3 260
1989	177 800	170 200	7 600	4.4	3 500	2.0	170	–2 950
1990	199 500	201 000	–1 500	–0.8	–4 500	–2.3	230	–300
1991	205 500	206 000	–500	–0.2	–3 500	–1.7	100	550
1992	217 800	219 600	–1 800	–0.8	–7 900	–3.6	100	1 040
1993	226 000	223 700	2 300	1.0	–4 400	–1.9	140	–300
1994[4]	247 500	239 500	8 000	3.2	–500	–0.2		

1. About 14 per cent of revenues and expenses are estimated for non-reporting airlines. Being based on traffic information, these estimates can be considered quite reliable with respect to operating items but are very uncertain with respect to non-operating items and taxes.
2. Excluding operations within the Commonwealth of Independent States.
3. The net result is derived from the operating result by adding (with plus or minus sign as appropriate) non-operating items (such as interest and direct subsidies) and income tax. The operating and net results quoted, particularly the net results, are the small differences between estimates of large figures (revenues and expenses) and are therefore susceptible to substantial uncertainties.
4. Preliminary estimates.

Source: ICAO Air Transport Reporting Form EF-1.

5.16 The change in the structure of operating revenues and expenses over the past decade is illustrated in Table 5-5. The share of "incidental revenues" (which include sales of services and maintenance, and the leasing of aircraft to other airlines) has increased from 5.7 per cent to 10.6 per cent, while there has been a comparable decline in the share of "revenues from scheduled services". The counterpart of some of these changes on the expense side was an increase in the share of "flight operations — other", which includes rental of aircraft from other companies. This suggests some restructuring within the airline industry. However, of more significance is the increase in the share of "indirect" expenses, and especially "general, administrative and other operating expenses", and the corresponding decline in the share of "direct aircraft" expenses which benefitted from productivity improvements and reductions in fuel prices.

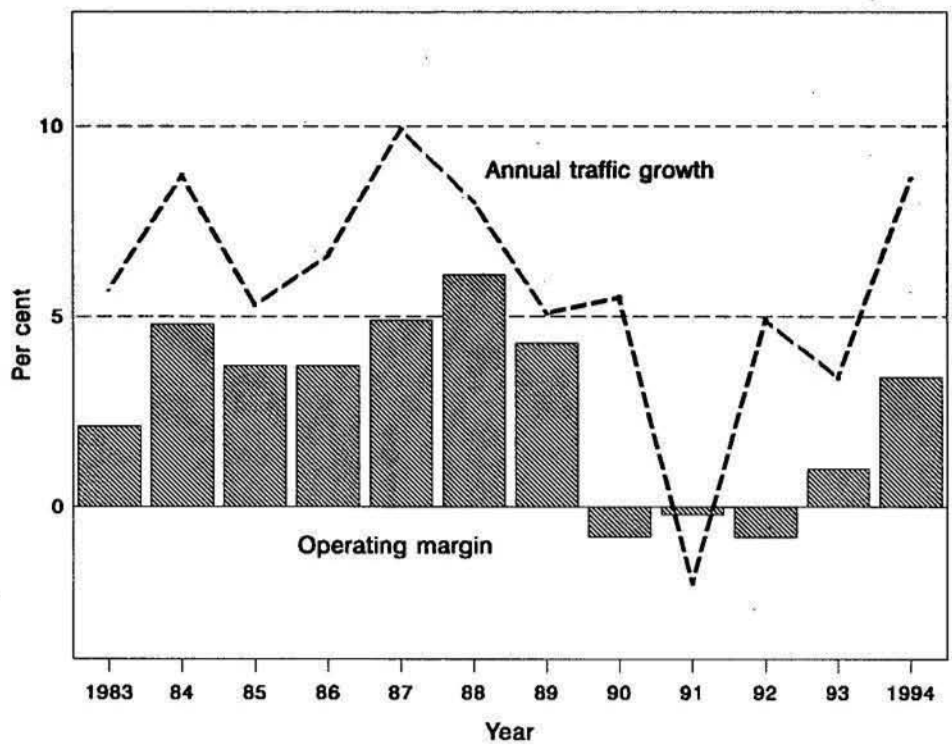
Table 5-5. Distribution of operating revenues and expenses in 1983 and 1993
(scheduled airlines of ICAO Contracting States[1], total domestic and international services)

Description	Distribution by item (per cent) 1983	1993	Change in per cent share of item 1983 to 1993
OPERATING REVENUES			
Scheduled services (total)	91.5	85.8	–5.7
Passenger	78.9	75.9	–3.0
Freight	11.0	9.0	–2.0
Mail	1.5	1.0	–0.5
Non-scheduled operations	2.8	3.6	0.8
Incidental	5.7	10.6	4.9
TOTAL	100.0	100.0	—
OPERATING EXPENSES			
Direct aircraft			
Flight operations (total)	34.4	26.5	–7.9
Flight crew	7.1	7.4	0.3
Fuel and oil	24.5	12.0	–12.5
Other	2.7	7.1	4.4
Maintenance and overhaul	10.0	10.1	0.1
Depreciation and amortization	7.2	7.0	–0.2
Sub-total	51.6	43.6	–8.0
Indirect			
User charges and station expenses (total)	15.9	17.3	1.4
Landing and associated airport charges	3.3	4.1	0.8
En-route facility charges	1.3	2.4	1.1
Station expenses	11.3	10.8	–0.5
Passenger services	9.2	10.5	1.5
Ticketing, sales, promotion	16.4	16.4	0
General, administrative and other	6.9	12.2	5.3
Sub-total	48.4	56.4	8.0
TOTAL	100.0	100.0	—

1. Excludes operations within the Commonwealth of Independent States.

Source: ICAO Air Transport Reporting Form EF-1.

5.17 The variations in the annual operating result, measured as a percentage of airline revenue, are illustrated graphically for the period 1983-1994 in Figure 5-5, which also shows the fluctuations in traffic growth over the same period. There is a positive correlation between this measure of financial return and the growth in traffic. However, close examination of the recent annual changes reveals that the recession in financial results began in 1990 when traffic growth was 5 per cent. Furthermore, traffic rebounded in 1992 after a decline in 1991, while the operating result remained in deficit. Part of the explanation of the financial outcome in 1990 lies in a substantial increase in fuel prices (and hence operating expenses), without compensating increases in yields. In 1992, yields declined significantly in nominal terms, helping to boost traffic but having a depressing effect on financial return. In 1993 and 1994, yields became somewhat more stable and cost efficiency improvements began to bear fruit, resulting in improved financial performance.

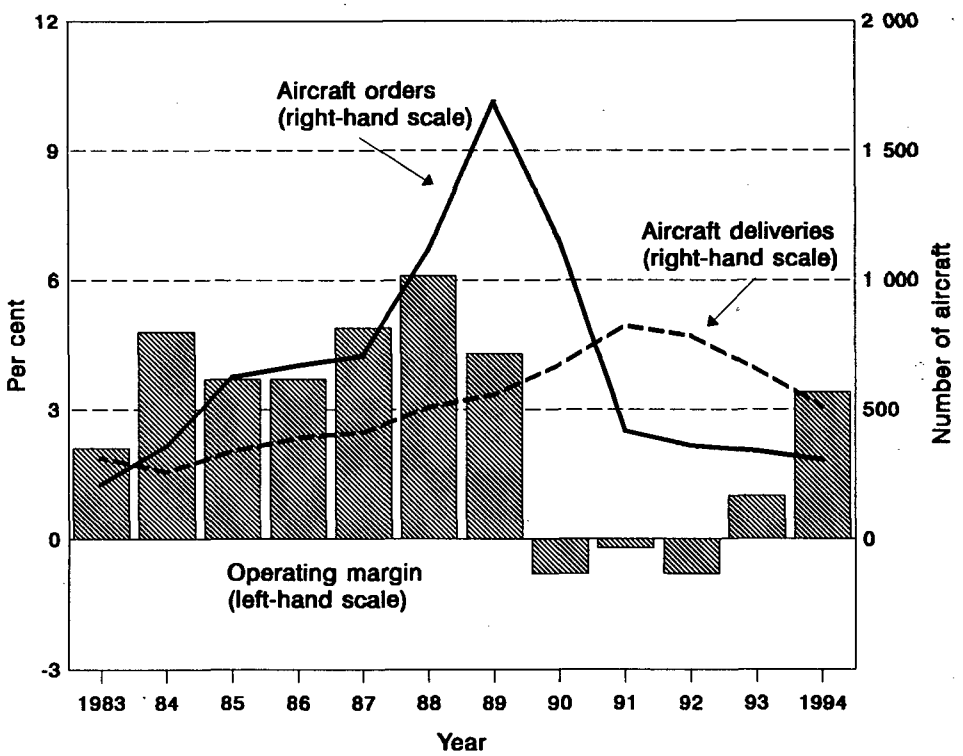


Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 5-5. Financial return and traffic growth — scheduled airline industry

5.18 The pattern of investment in aircraft is related to the cycle of financial performance. Annual aircraft orders and deliveries are shown in Figure 5-6, together with the annual financial return of the carriers. The high levels of aircraft deliveries in recent years (especially 1991 and 1992) have been accompanied by increased depreciation and introductory costs and hence increased expense per unit of output. Furthermore, the arrival of large amounts of new capacity, combined with softening demand during the recessionary period, encouraged competitive reductions in fares and hence reduced revenue per unit of output.

5.19 The high rates of aircraft deliveries in the early 1990s resulted from very high volumes of aircraft orders in earlier years, which were generated by strong traffic growth and a ready availability of finance. Because of the lag between orders and deliveries, the buoyant market conditions which existed at the time of peak order levels had changed by the time the peak deliveries were made, which exacerbated the mismatch between supply and demand in the industry. With aircraft orders at low levels since 1991 and with the postponement and cancellation of some orders, aircraft deliveries are returning to more moderate levels, at least in the short term. Together with improved demand, this is helping to reduce excess capacity in the industry.



Source: ICAO Air Transport Reporting Form EF-1 and aircraft manufacturers.

Figure 5-6. Financial return and aircraft supply

AIRLINE PASSENGER TRAFFIC FORECAST

5.20 As a basis for the traffic forecasts for this study, econometric analyses were carried out to determine the historical relationship between airline passenger traffic, economic cycles and airline yield levels. These analyses were used to translate the expectations of future global economic development and yield levels into annual projections of traffic demand for the years 1995, 1996 and 1997 according to the methodology described in Appendix 2. These forecasts were then reviewed in the light of prospective changes in other relevant factors which could not be incorporated into the econometric models.

5.21 While at a global level these models appear to provide reasonably robust results, they have been less adequate at a micro or regional level because of the influence of unique factors and uncertainties in the air transport industry in recent years.

5.22 The economic forecasts, which were introduced at the beginning of this chapter, are based on assumptions about broad business cycle developments, fiscal and monetary policy settings and the international trade environment. These factors are largely external to the aviation sector. The reasonably positive economic outlook presented in Figure 5-1 and Table 5-1 augurs well for global traffic demand over the forecast period.

5.23 The prospects for airline yields are closely related to cost developments and market conditions in the airline industry. Changes in fuel prices have had important effects on costs, and hence on both financial returns and airline yields, at certain times in the past. However, in recent years, fuel price volatility has been short term, and year average price levels have tended to decline gradually. In 1994 fuel markets began to tighten, and in its most recent forecast the OECD predicts a slow upward trend in the world crude oil price over the medium term.

5.24 During the recession, airline yields were probably affected more by excess supply in airline markets than by movements in the prices of fuel, labour or other inputs used by the industry. Discounted fares helped to increase traffic and offset the effect of a weak economy. With economic recovery, market conditions are changing as a better balance of supply and demand is achieved. In this environment, fares are likely to become firmer during the forecast period.

5.25 The global and regional scheduled passenger traffic forecasts for 1995, 1996 and 1997, developed from the economic and yield assumptions and other considerations, are presented in Table 5-6. General economic expansion is expected to provide the main support for traffic demand. Because of improving economic growth, global passenger traffic is expected to grow by 6.5 per cent in 1995, 6.7 per cent in 1996 and 7 per cent in 1997. The forecast growth rates for total world traffic are illustrated in Figure 5-7, together with the annual growth pattern over the past 10 years.

5.26 Traffic growth will vary by geographic region because of the impact of specific local or regional factors. Along with its general economic outlook, the Asia/Pacific region is expected to continue to have the highest rate of growth in air passenger traffic, although below the

Table 5-6. ICAO scheduled passenger traffic forecast for 1995-1997
(passenger-kilometres performed)

Region of airline registration	ACTUAL 1983 (billions)	ACTUAL 1993 (billions)	Average annual growth (%)	ESTIMATED 1994 (billions)	Growth (%)	FORECAST 1995 (billions)	Growth (%)	1996 (billions)	Growth (%)	1997 (billions)	Growth (%)
Africa	34.4	43.3	2.3	45.7	5.6	48.0	5.0	50.7	5.5	53.5	5.7
Asia/Pacific	190.0	437.8	8.7	490.5	12.0	537.1	9.5	585.4	9.0	638.1	9.0
Europe (excl. CIS)	211.8	403.9	6.7	437.7	8.4	471.4	7.7	506.7	7.5	543.7	7.3
Middle East	38.1	58.4	4.4	62.2	6.5	66.2	6.5	70.5	6.5	75.1	6.5
North America	478.8	813.7	5.4	863.5	6.1	911.0	5.5	961.1	5.5	1 015.8	5.7
Latin America/ Caribbean	60.1	96.1	4.8	102.8	6.9	107.9	5.0	114.4	6.0	122.4	7.0
World (excl. CIS)	1 013.3	1 853.2	6.2	2 002.3	8.0	2 141.5	7.0	2 288.7	6.9	2 448.7	7.0
Europe (incl. CIS)	388.3	504.2	2.6	521.5	3.4	551.8	5.8	589.6	6.8	632.8	7.3
World (incl. CIS)	1 189.7	1 953.6	5.1	2 086.1	6.8	2 222.0	6.5	2 371.6	6.7	2 537.8	7.0

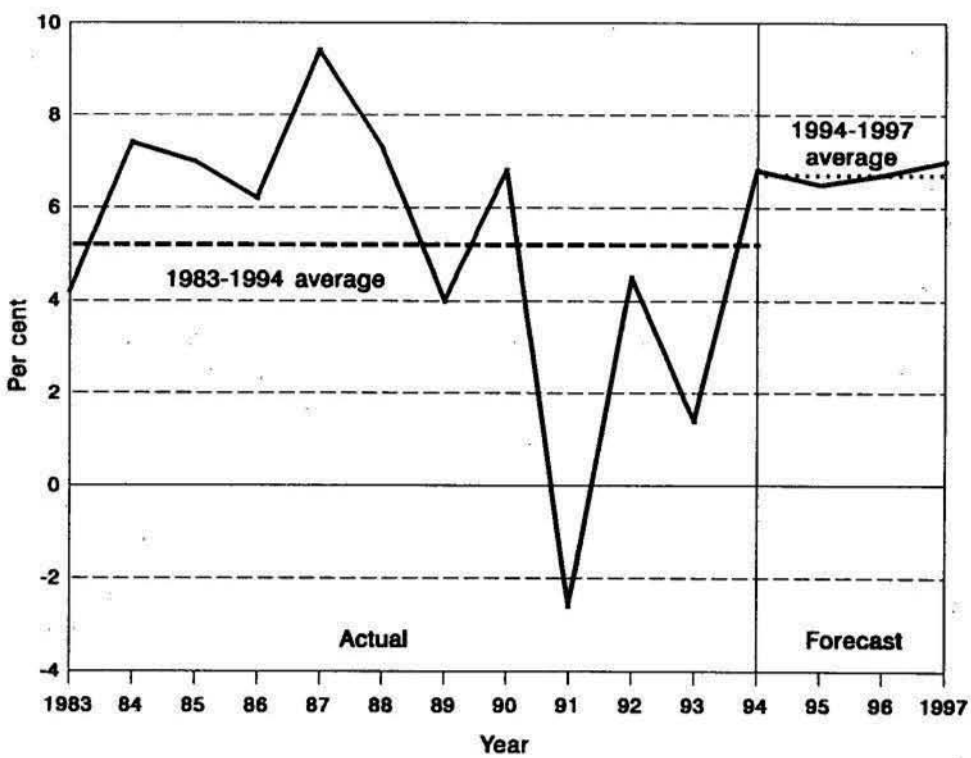


Figure 5-7. World scheduled passenger traffic growth — passenger-kilometres performed

impressive 12 per cent experienced in 1994. For Europe, increasingly competitive market conditions in the European Union and the stabilization of aviation markets in the CIS are expected to be key factors supporting traffic growth over the next few years. In the past decade, Africa has had the slowest traffic growth of all the ICAO regions. However, with recovery in 1994 and a better economic outlook, traffic growth in Africa is expected to be much stronger over the forecast period. Further details of the trends and forecasts on a region-by-region basis may be found in Chapter 6.

AIRLINE FINANCIAL FORECAST

5.27 Financial trends in the airline industry are much more difficult to forecast than traffic trends because they are composed of a number of variables and airlines are able to adjust capacity and manage yields through fare adjustments at relatively short notice to respond to (or to create) changes in demand. In addition, ICAO receives airline financial data on an annual basis only, the period between transaction and reporting is much greater than for traffic data, and there are significant gaps in reporting. Hence, the forecasts are restricted to indicative global trends in financial results (excluding operations within the Commonwealth of Independent States, for which no historic data were available).

5.28 The forecast for total revenues for scheduled airlines is based on the passenger forecasts and assumptions for real passenger yields presented above, together with further assumptions for general inflation and the trend in the share of airline revenue from sources other than scheduled passengers (i.e. freight, mail, non-scheduled operations and incidental). This produces a growth in total revenues of about 9.5 per cent in 1995, 9.8 per cent in 1996 and 10.2 per cent in 1997. These compare with an average rate of 8.9 per cent per annum over the past ten years.

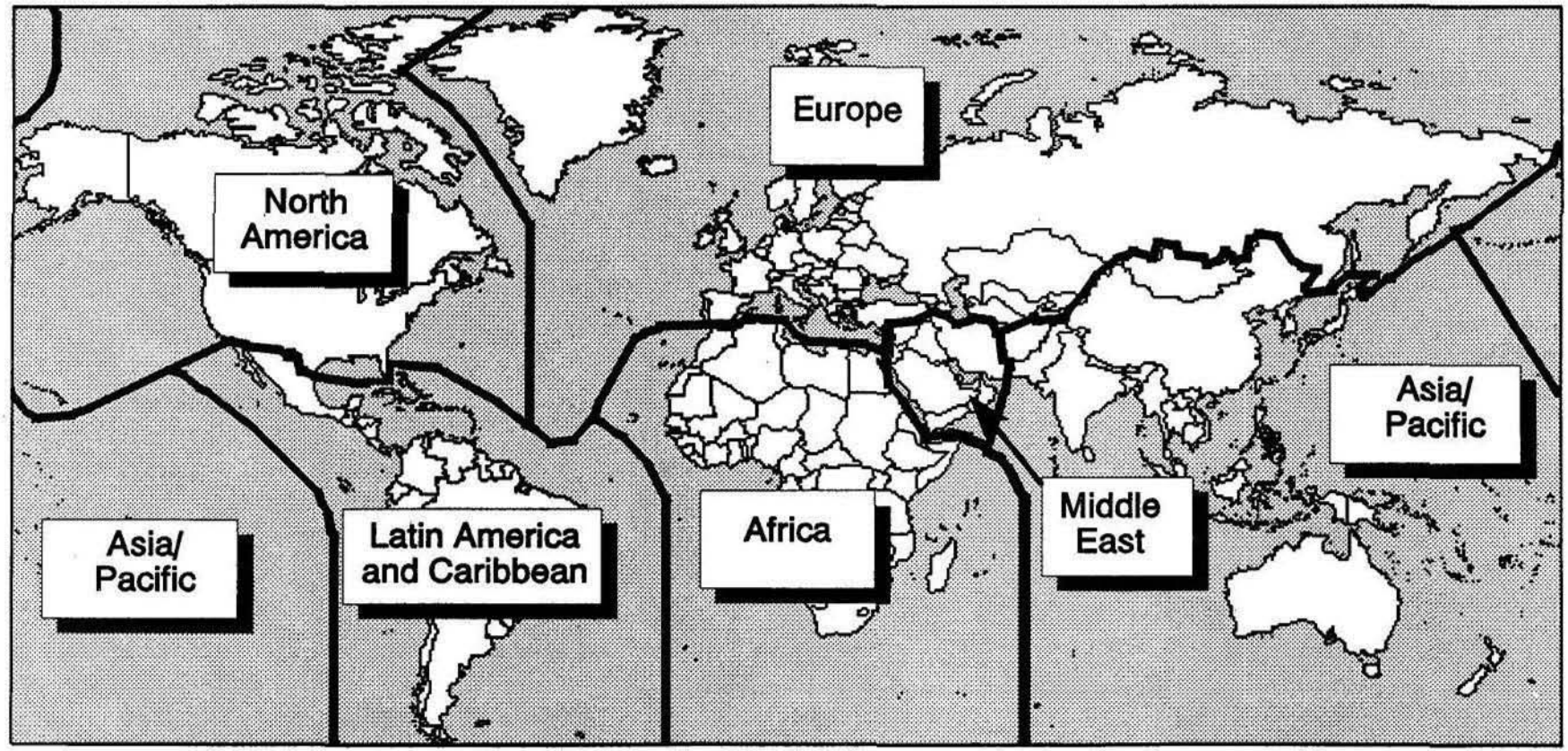
5.29 The forecast for airline expenses is based on assumptions for the expected trends in quantity of inputs (labour, fuel and aircraft capacity) and the prices of those inputs, the latter being primarily determined by the outlook for general inflation. Current financial difficulties have prompted airlines to take steps to trim employment levels and defer aircraft deliveries and hence improve productivity and contain costs. As a result of these considerations, airline expenses are expected to grow at rates of about 9.2 per cent in 1995, 9.7 per cent in 1996 and 9.7 per cent in 1997 (compared with an average rate of 9.1 per cent per annum over the past ten years).

5.30 The operating result for the world's scheduled airlines is the difference between operating revenues and expenses, the forecasts of which have here been made independently and which are both subject to significant margins of error. It is therefore not possible to forecast the operating result with any reasonable degree of certainty. Nevertheless, the above forecasts of operating revenues and expenses imply that the operating result as a per cent of operating revenues will improve from an estimated 3.2 per cent in 1994 to 3.7 per cent in 1995, 3.7 per cent in 1996 and 4.1 per cent in 1997.

PART III

REGIONAL PERSPECTIVES, 1994 TO 1997

ICAO STATISTICAL REGIONS



International boundaries shown on this map do not imply official endorsement or acceptance by ICAO.

Chapter 6
Regional Highlights, Trends and Forecasts

6.1 This chapter reviews, on a region-by-region basis, some key developments affecting air transport in 1994, the economic environment over the period since 1983 and anticipated through to 1997, and airline finances and passenger traffic trends over the period since 1983; and presents scheduled passenger traffic forecasts for the airlines of each region through to 1997. The regional basis is that of the ICAO Statistical Regions (see map), presented as follows: Africa; Asia/Pacific; Europe; Middle East; North America; Latin America/Caribbean.

AFRICA

The Region in 1994

Table 6-1. Scheduled traffic — airlines of Africa

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	12 800	4.1	3.8	25 190	3.1	2.1
Passenger-kilometres performed (millions)	37 520	6.3	3.3	45 730	5.6	2.2
Freight and mail tonne-kms performed (millions)	1 450	17.7	2.2	1 560	17.8	1.9

Source: ICAO Air Transport Reporting Form A-1.

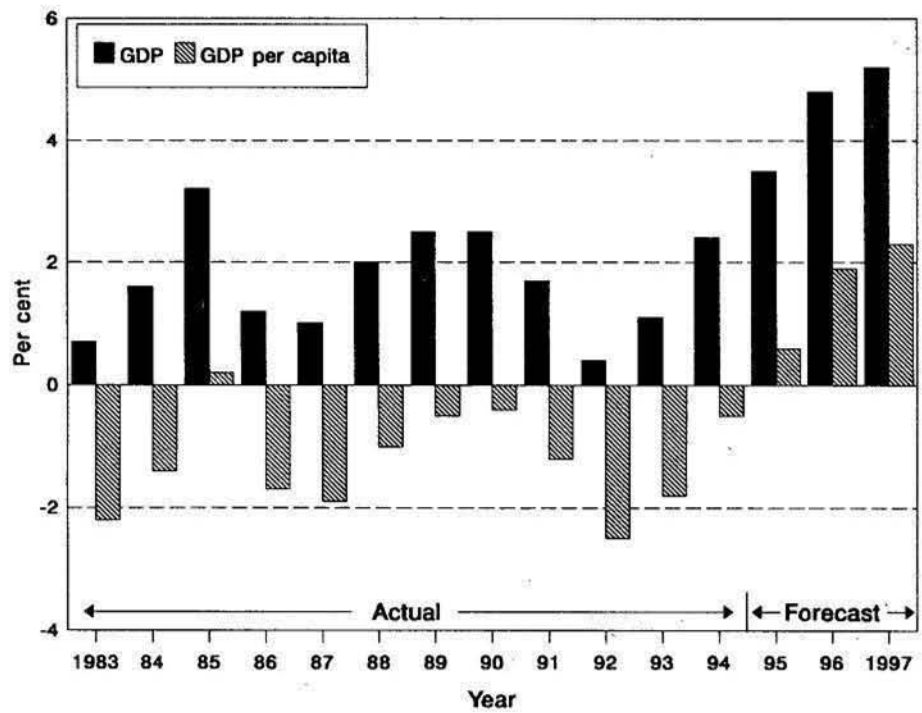
6.2 Although there are some signs of improvement, States in the region continued to be faced with a difficult economic environment, including a high external debt, persistent drought and encroaching desertification in the Sahel region and, in some States, political uncertainty. Physical infrastructure continued to deteriorate due to lack of maintenance and renovation.

Economic adjustment programmes at all levels of the general economy and particularly on transportation, including civil aviation and national airline activities, were maintained and cost-cutting measures continued in many African States.

6.3 As indicated in Chapter 2, at a meeting held in September, the African ministers responsible for civil aviation adopted a number of revisions to the Yamoussoukro Declaration of 1988 in order to improve its implementation.

Economic Trends

6.4 Over the 1983-1993 period, the aggregate African economy (GDP) grew at an average annual rate of 1.7 per cent in real terms, although GDP per capita fell at 1.3 per cent. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-1.



Source: IMF, Wharton Econometrics Services.

Figure 6-1. Annual change in real GDP and GDP per capita — Africa

6.5 Economic conditions in the region have been adversely affected by the external environment, particularly slower growth in export markets and declining terms of trade, and States in the region have faced increasing difficulties in foreign debt servicing.

6.6 For 1994, the real growth of GDP is estimated to be around 2.4 per cent. Over the next three years, further improvement in the external environment is expected, reflecting ongoing recovery in world markets which should support a better economic performance in Africa. The economy of the African region is projected to increase at 3.5, 4.8 and 5.2 per cent for the years 1995, 1996 and 1997, respectively.

Airline Financial Trends

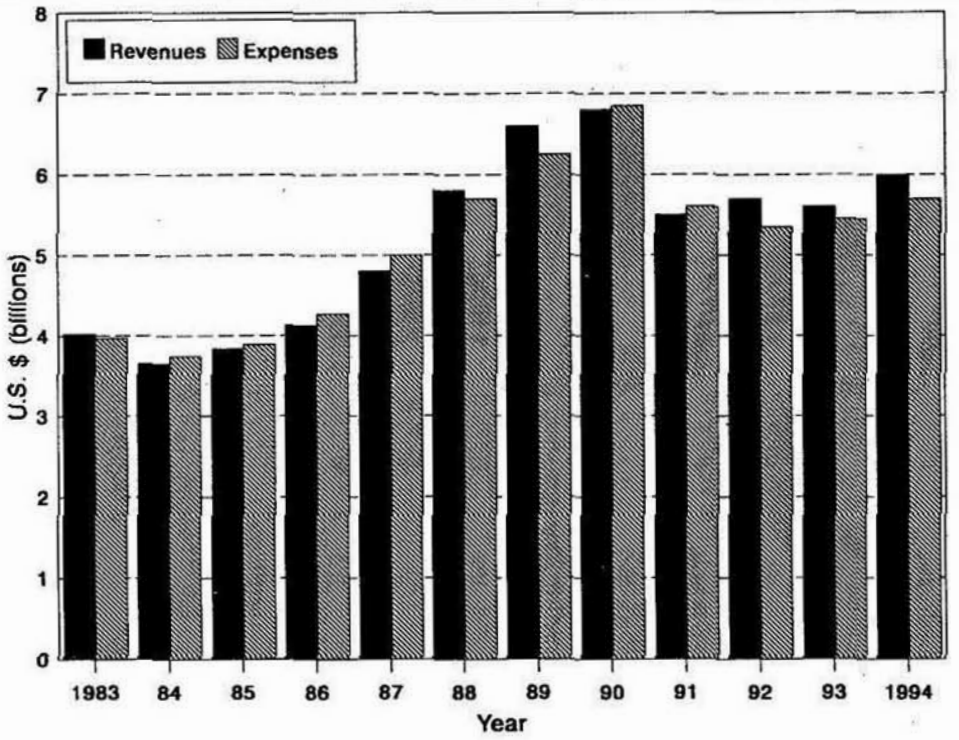
6.7 Over the 1983-1993 period, operating revenues of the scheduled airlines of the African region increased at an average annual rate of 3.3 per cent (compared with the world annual average of 8.7 per cent). Operating expenses for the same period increased by 3.2 per cent per annum. Positive operating results were achieved in 1983, 1988, 1989, 1992, 1993 as well as in 1994 (according to the latest estimates) as illustrated in Figure 6-2.

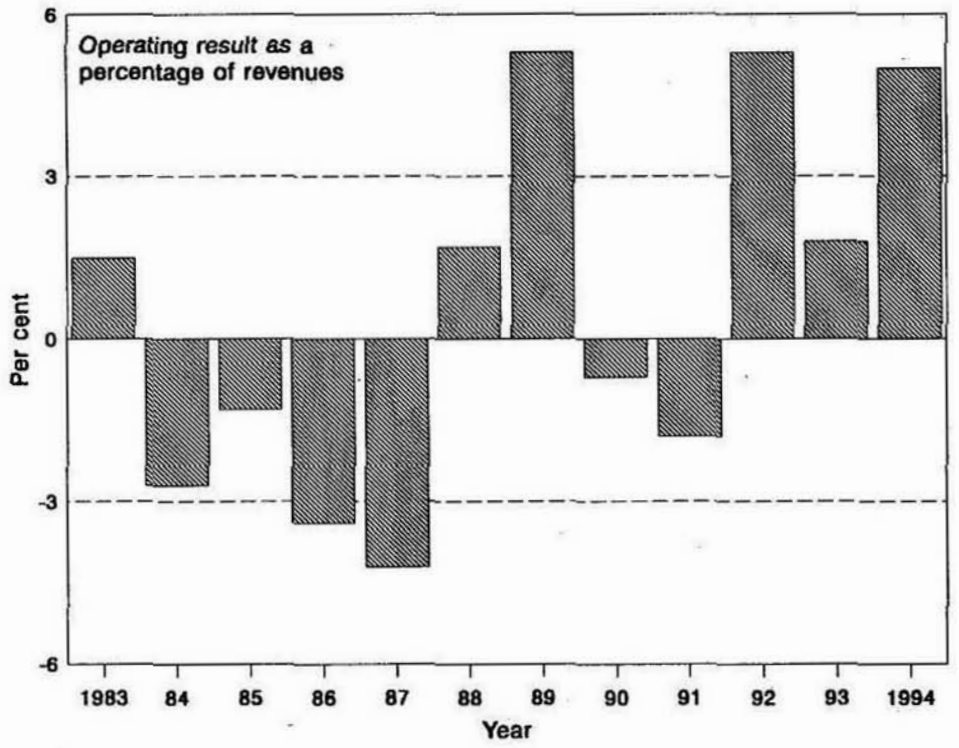
6.8 For the 1983-1993 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 3.2 per cent in real terms (compared with a 1.9 per cent decline for the world). The year-to-year comparisons of the changes in real passenger yield of African and world airlines are illustrated in Figure 6-3. Throughout the period concerned, the region's airlines achieved a high average yield level in comparison with the world average.

Airline Passenger Traffic Trends and Forecast

6.9 Over the 1983-1993 period, scheduled passenger traffic (passenger-kilometres performed) of airlines of the African region increased at an average annual rate of 2.3 per cent (compared with the world annual average of 5.1 per cent). A solid increase in traffic of over 6 per cent was recorded in 1994. The year-to-year traffic growth comparison between world and African airlines is shown in Figure 6-4.

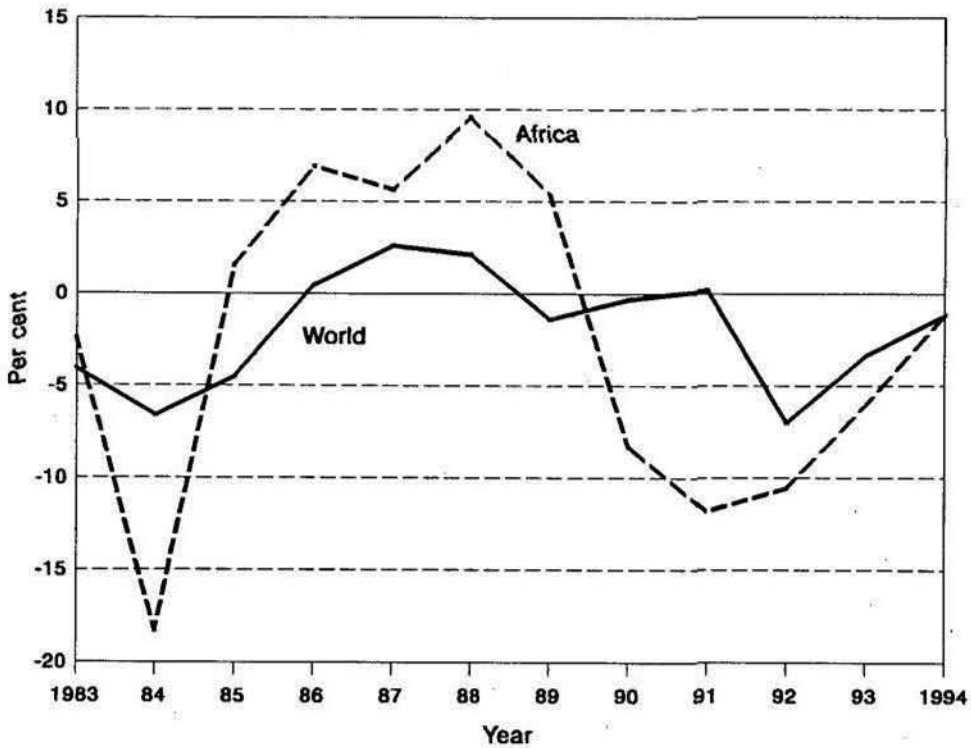
6.10 As shown in Table 5-6 of Chapter 5 and illustrated in Figure 6-4, scheduled passenger traffic of the airlines of the African region is expected to increase by 5, 5.5 and 5.7 per cent for the years 1995, 1996 and 1997, respectively, compared with world airline growth of 6.5, 6.7 and 7 per cent. The expectations for improved growth for African airlines are based primarily on an improved economic outlook.





Note.— 1994 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-2. Scheduled airline operating revenues and expenses — Africa



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-3. Annual change in real scheduled passenger yield — Africa and World

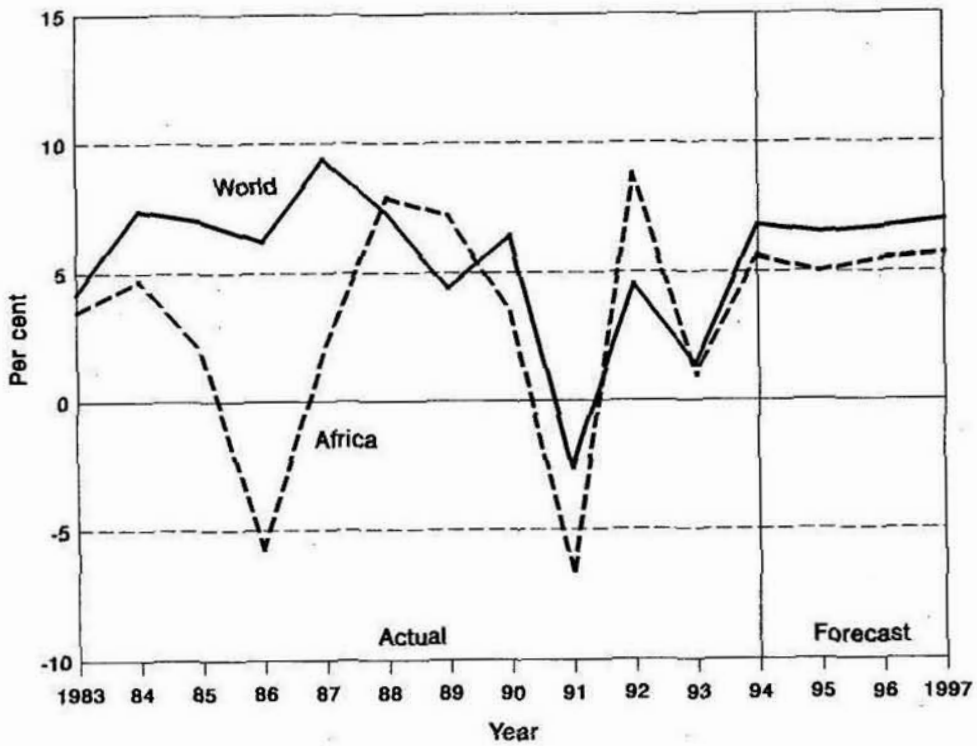


Figure 6-4. Scheduled passenger traffic growth (PKPs) — Africa and World

ASIA/PACIFIC

The Region in 1994

Table 6-2. Scheduled traffic — airlines of Asia/Pacific

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	80 000	7.6	23.5	273 500	10.6	22.7
Passenger-kilometres performed (millions)	333 860	11.8	29.4	490 460	12.0	23.5
Freight and mail tonne-kms performed (millions)	23 530	11.6	35.4	25 990	12.4	31.7

Source: ICAO Air Transport Reporting Form A-1.

6.11 During the year, the Chinese Government announced a new policy that would allow foreign investment of up to 35 per cent in its airlines and up to 49 per cent in its airports. India repealed its Air Corporation Act and ended the monopoly of Air India and Indian Airlines; these two airlines have been incorporated as public limited liability companies. India also revised its regulations to allow air taxi operators/private domestic airlines to start scheduled operations in competition with the State-owned carriers. As already indicated in Chapter 2, Australia decided not to proceed with the full implementation of plans for a single market between Australia and New Zealand that was to come into effect on 1 November 1994.

6.12 Foreign investment in new air carriers and alliances between carriers were also important features in this region during 1994.

Economic Trends

6.13 Over the 1983-1993 period, the aggregate Asia/Pacific economy (GDP) grew at an average annual rate of 5.1 per cent in real terms, and GDP per capita increased at 3.2 per cent, the highest growth rates of all ICAO regions. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-5.

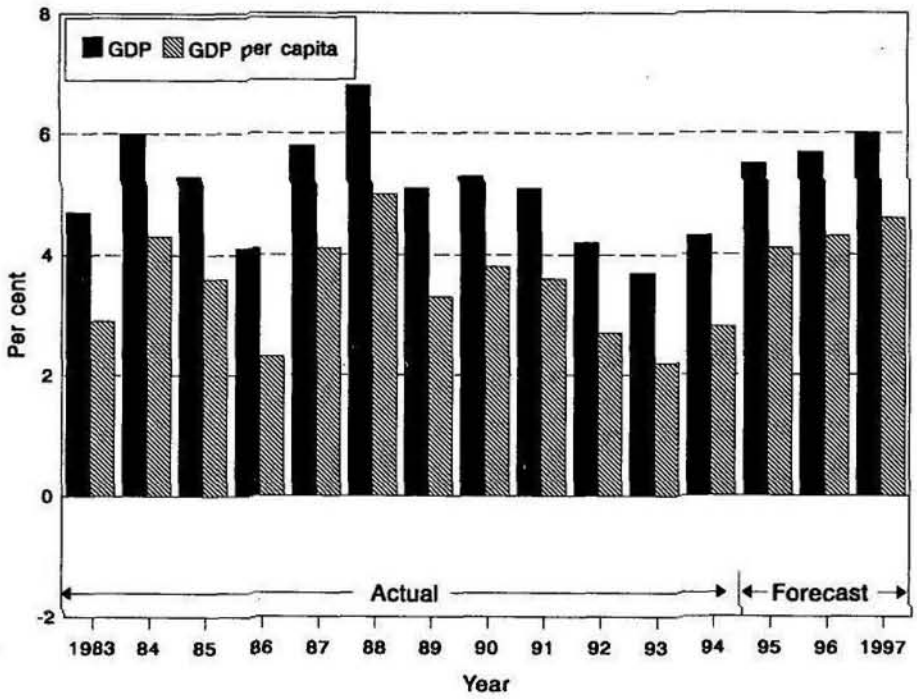
6.14 Economic growth in the region slowed in the 1991 to 1993 period, primarily because of a substantial slowdown in the Japanese economy. Recovery in Japan is progressing at a slow pace despite low interest rates and active fiscal stimulus. The developing economies of the

region are expected to grow rapidly, fuelled by market-oriented structural reforms and investment in infrastructure. The economies of Australia and New Zealand have also gained momentum with growth rates of around 4.5 per cent in 1993 and 1994.

6.15 For the region as a whole, economic growth in 1994 is estimated to be about 4.3 per cent. Real growth in GDP is expected to be 5.5 per cent in 1995, 5.7 per cent in 1996 and 6 per cent in 1997.

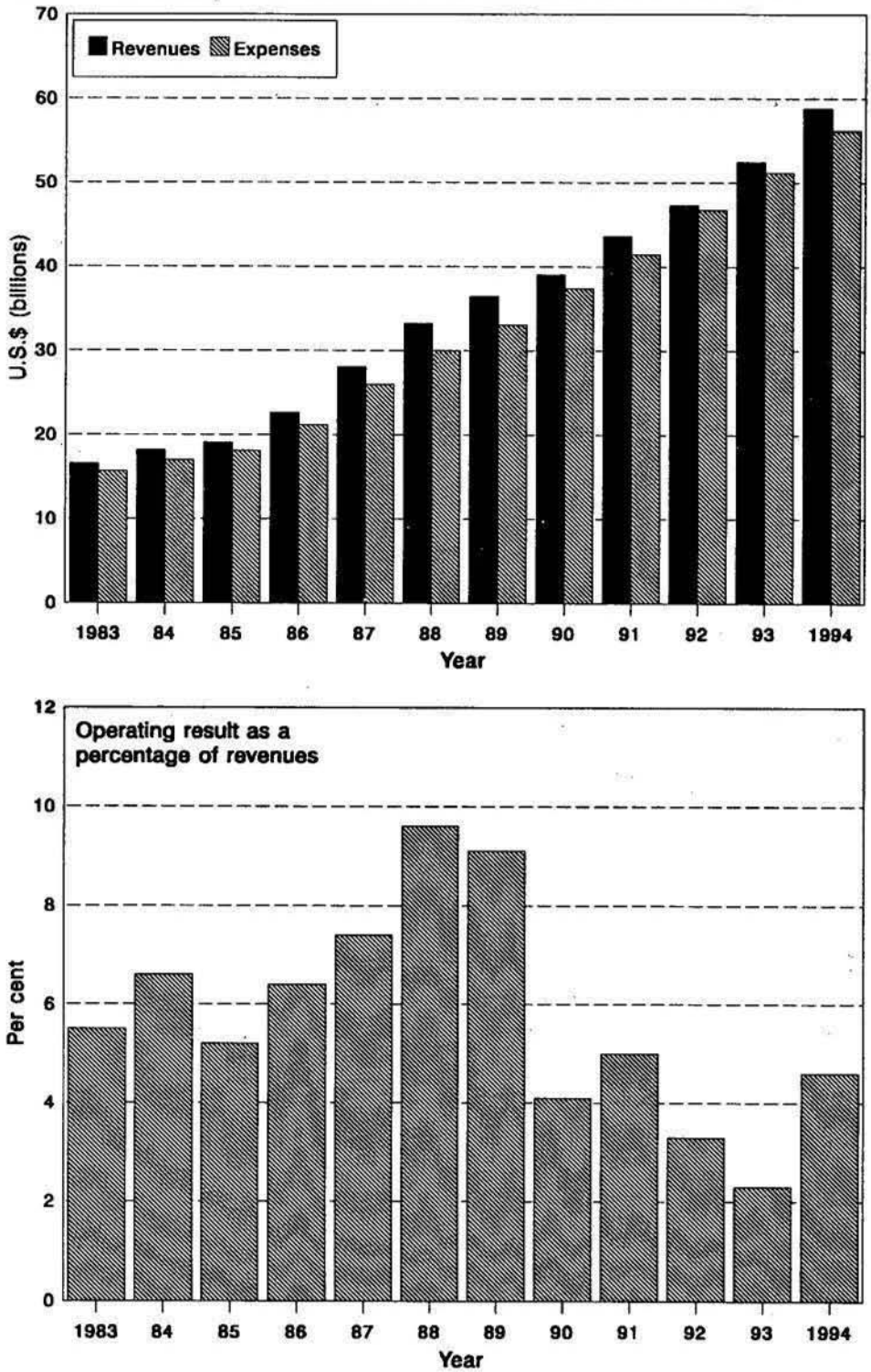
Airline Financial Trends

6.16 Over the 1983-1993 period, operating revenues of the scheduled airlines of the Asia/Pacific region increased at an average annual rate of 12.2 per cent (compared with the world annual average growth rate of 8.7 per cent). Operating expenses for the same period increased by 12.5 per cent per annum. Positive operating results were achieved throughout the period 1983 to 1993, as illustrated in Figure 6-6, which also shows an estimated positive result for 1994.



Source: IMF, Wharton Econometrics Services.

Figure 6-5. Annual change in real GDP and GDP per capita — Asia/Pacific



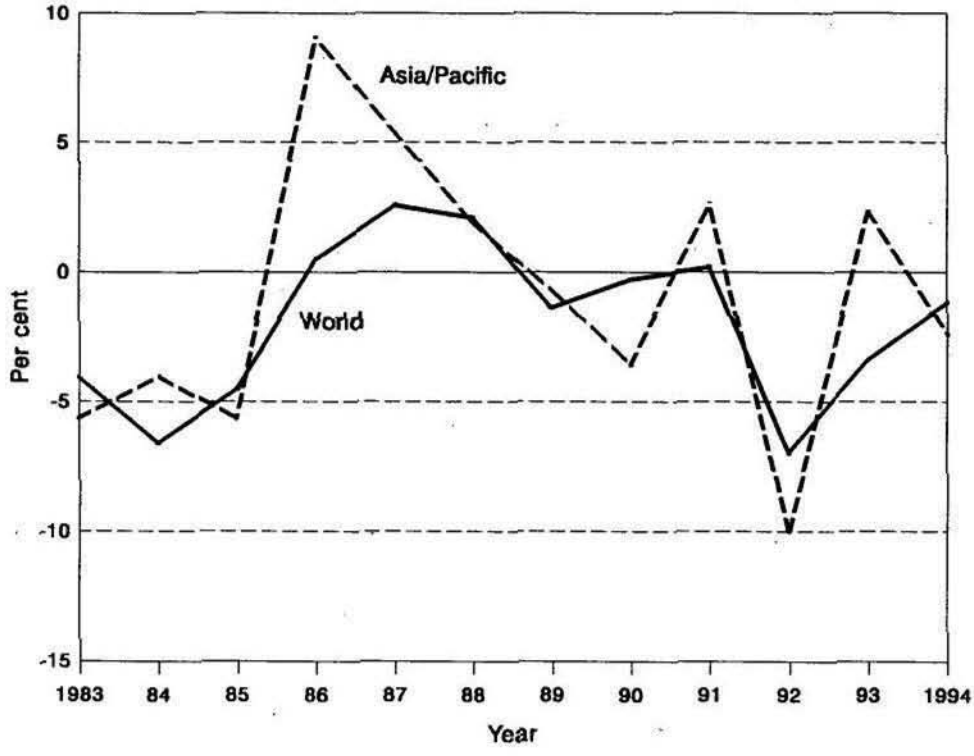
Note.— 1994 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-6. Scheduled airline operating revenues and expenses — Asia/Pacific

6.17 For the 1983-1993 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 0.4 per cent in real terms (compared with a 1.9 per cent per annum decline for the world). A reduction of 2.4 per cent has been estimated for 1994. The year-to-year comparisons of the changes in real passenger yield of Asia/Pacific and world airlines are illustrated in Figure 6-7.

Airline Passenger Traffic Trends and Forecast

6.18 Over the 1983-1993 period, scheduled passenger traffic (passenger-kilometres performed) of airlines of the Asia/Pacific region increased at an average annual rate of 8.7 per cent (compared with the world annual average of 5.1 per cent). Very strong growth in traffic (12 per cent) was estimated for 1994. The year-to-year traffic growth comparison between world and Asia/Pacific airlines is shown in Figure 6-8.



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-7. Annual change in real scheduled passenger yield — Asia/Pacific and World

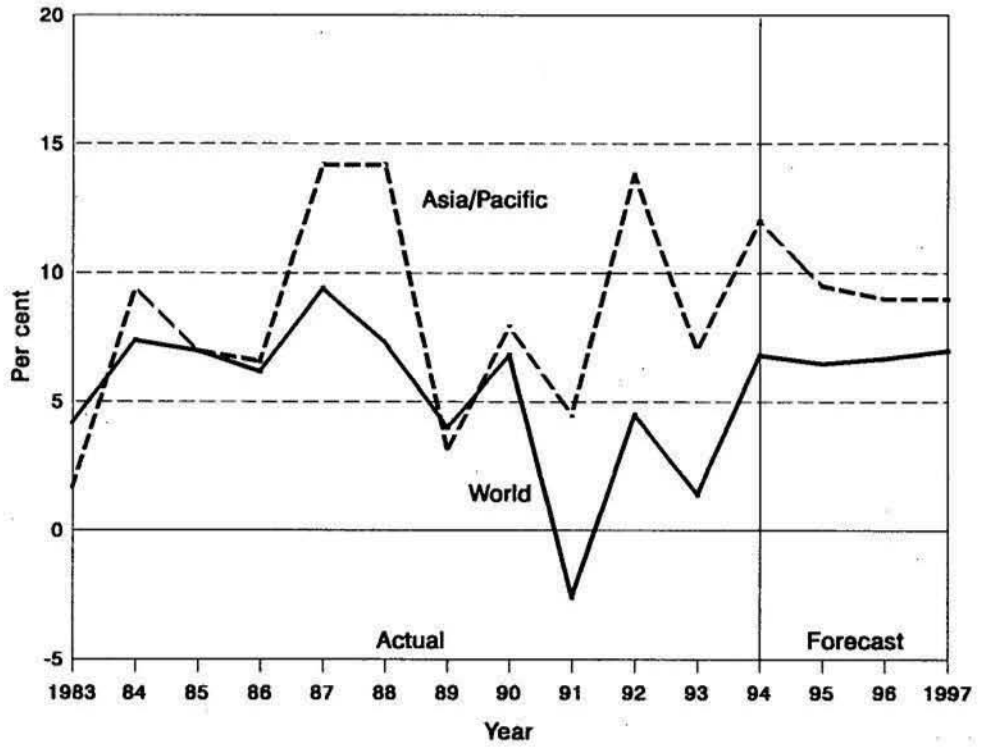


Figure 6-8. Scheduled passenger traffic growth (PKPs) — Asia/Pacific and World

6.19 As shown in Table 5-5 of Chapter 5 and illustrated in Figure 6-8, scheduled passenger traffic of the airlines of the Asia/Pacific region is expected to increase by 9.5, 9 and 9 per cent for the years 1995, 1996 and 1997, respectively, compared with world airline growth of 6.5, 6.7 and 7 per cent. The outlook for traffic growth of the airlines of the Asia/Pacific region is the strongest of any ICAO region.

EUROPE

The Region in 1994

Table 6-3. Scheduled traffic — airlines of Europe

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	144 170	5.7	42.4	276 260	-2.3	23.0
Passenger-kilometres performed (millions)	390 720	8.6	34.4	521 500	3.4	25.0
Freight and mail tonne-kms performed (millions)	22 540	13.9	34.0	23 530	12.4	28.7

Source: ICAO Air Transport Reporting Form A-1.

6.20 Having undergone the required national statutory processes, three countries were welcomed as new Member States of the European Union (EU) — Austria, Finland and Sweden, bringing the total membership as of 1 January 1995 to fifteen.

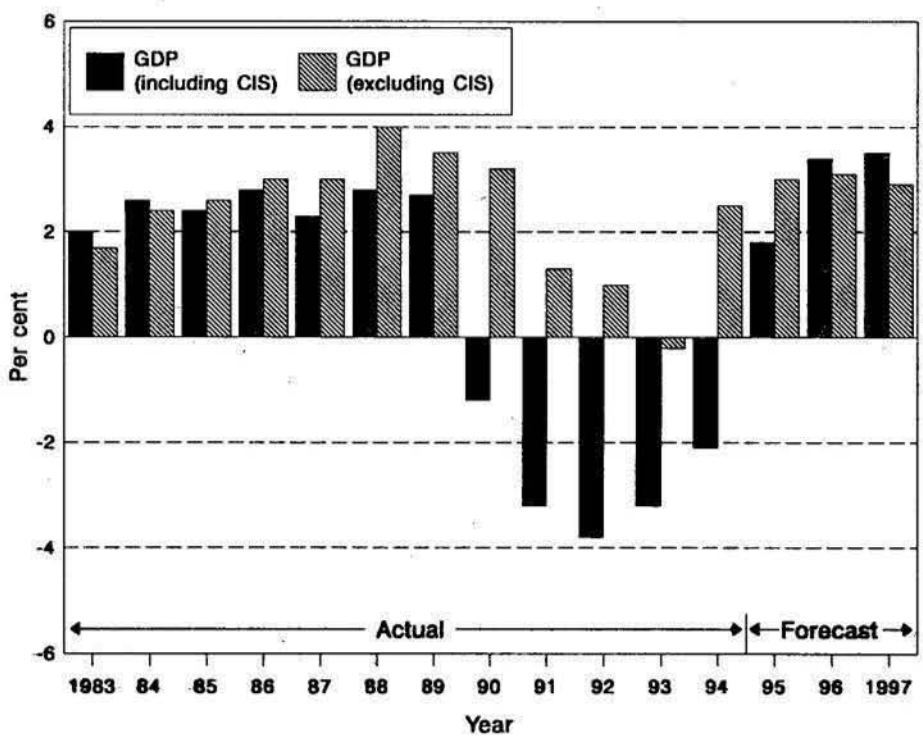
6.21 The European Civil Aviation Conference (ECAC) began work jointly with the European Commission (which has published a proposal for an EU Council Directive) on the question of the provision of ground-handling services at European airports. It further decided to begin work, also in co-operation with the European Commission, on airline code-sharing. During the year ECAC brought to a conclusion a detailed review of the air carrier liability system for passengers by adopting a recommendation calling on air carriers and their associations to update, on a voluntary basis, certain basic elements of the existing system. The intention is that liability limits would be increased to restore in real terms the values established in the 1970s and other improvements are also envisaged. ECAC Directors General also adopted a revised Code of Conduct for computer reservation systems.

6.22 Despite continued traffic growth, considerable improvements continue to be experienced in the delays caused by air traffic congestion. The Ministers of Transport of ECAC Member States, meeting in Copenhagen in June, reaffirmed their support for the plan they launched in 1990 to harmonize and integrate their air traffic systems. Looking to the needs of the next century, for which a European Air Traffic Management System (EATMS) is already being developed by EUROCONTROL, the Ministers commissioned a study of the institutional arrangements best suited to supporting the implementation of the EATMS. They also invited the European Space Agency with EUROCONTROL, the European Commission and ECAC Member States to jointly pursue proposals for the use of satellite technology in European air navigation.

Economic Trends

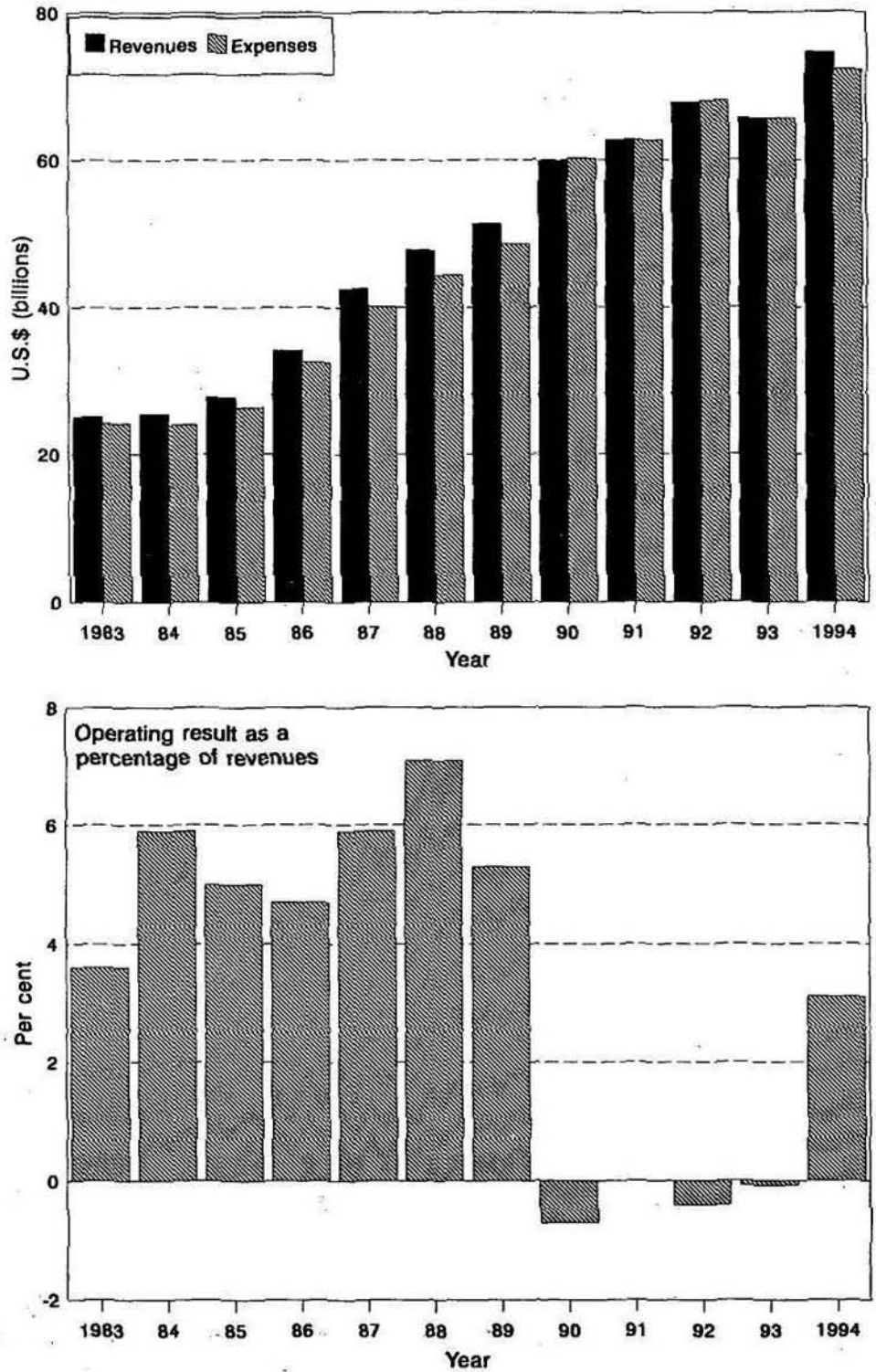
6.23 Over the 1983-1993 period, the aggregate European economy (GDP) grew at an average annual rate of 0.4 per cent in real terms. Population grew at 0.6 per cent per annum and GDP per capita declined at 0.2 per cent per annum over the same period. The average growth in GDP has been lower for Europe than for other regions. One reason for this is the relatively low population growth in Europe. A more important reason, however, is the serious decline in the economies of eastern Europe and the Commonwealth of Independent States (CIS) since 1989. The impact of this is illustrated in Figure 6-9, which shows the annual European GDP growth including and excluding the CIS. The average annual GDP growth for western Europe over the past decade was 2.4 per cent per annum.

6.24 Chapters 1 and 5 referred to the economic recovery in western Europe. There remains sufficient economic slack in Germany, France, the United Kingdom and several other European countries for growth to continue unhindered for several years. Western European GDP growth rates of 3 per cent, 3.1 per cent and 2.9 per cent are expected for 1995, 1996 and 1997, respectively. In some eastern European countries, the implementation of market-oriented reforms is beginning to bear fruit. However, another difficult year is expected in the CIS before recovery takes hold. Because of the structural changes that are occurring, there is an unusually large element of uncertainty associated with the medium-term economic outlook for the region as a whole.



Source: IMF, Wharton Econometrics Services.

Figure 6-9. Annual change in real GDP — Europe



Note.— 1994 figures are from estimated data. CIS excluded.

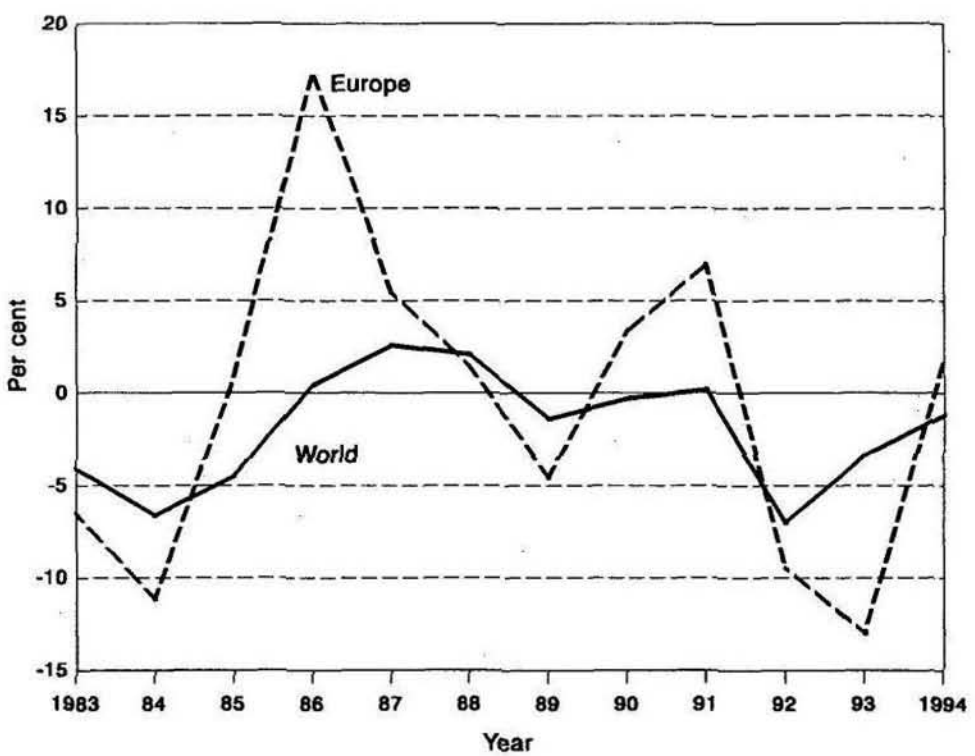
Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-10. Scheduled airline operating revenues and expenses — Europe

Airline Financial Trends

6.25 Over the 1983-1993 period, operating revenues of the scheduled airlines of the European region (excluding CIS) increased at an average annual rate of 10.1 per cent (compared with the world annual average of 8.7 per cent). Operating expenses for the same period increased by 10.5 per cent per annum. Positive operating results were achieved in the years 1983 to 1989 inclusive, while negative results occurred in 1990, 1992 and 1993, as illustrated in Figure 6-10. A positive result was achieved in 1994 (preliminary estimate).

6.26 For the 1983-1993 period, average scheduled passenger yields for airlines of the region (excluding CIS), measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 0.7 per cent in real terms (compared with a 1.9 per cent decline for the world). There were sharp declines in yield in 1992 and 1993, although yield increased slightly in 1994 (preliminary estimate). The year-to-year comparisons of the changes in the real passenger yield of European and world airlines are shown in Figure 6-11. The increase of over 17 per cent in European airline yields in 1986 can be largely attributed to the appreciation of European currencies with respect to the U.S. dollar.



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-11. Annual change in real scheduled passenger yield — Europe and World

Airline Passenger Traffic Trends and Forecast

6.27 Over the 1983-1993 period, scheduled passenger traffic (passenger-kilometres performed) of the airlines of the European region increased at an average annual rate of 2.6 per cent (compared with the world annual average of 5.1 per cent). If airlines of the CIS are excluded, European traffic grew at 6.7 per cent per annum over the period. Although the traffic of the CIS airlines declined again in 1994, this was more than offset by significant growth in the traffic of the airlines of western Europe. The year-to-year traffic growth comparison of the world's and the European airlines is shown in Figure 6-12.

6.28 As shown in Table 5-6 of Chapter 5 and illustrated in Figure 6-12, scheduled passenger traffic of the airlines of the western European region is expected to grow quite vigorously over the forecast period, and recovery is expected to begin in the CIS in 1996. For the region as a whole, growth rates of 5.8 per cent, 6.8 per cent and 7.3 per cent for the years 1995, 1996 and 1997, respectively, are expected (compared with world airline growth of 6.5, 6.7 and 7 per cent).

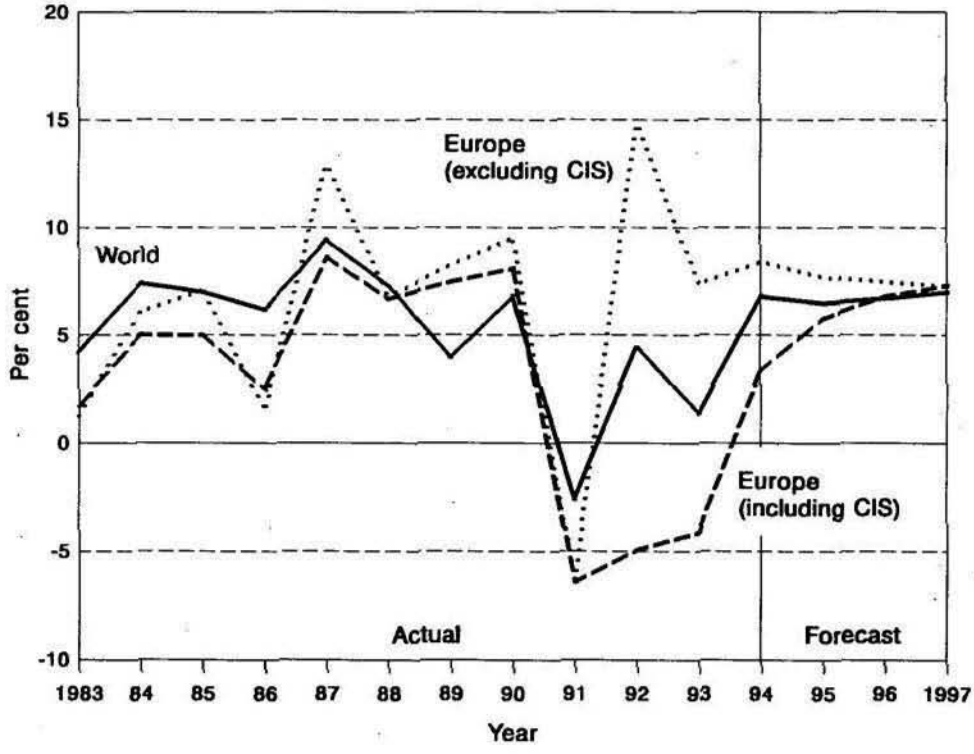


Figure 6-12. Scheduled passenger traffic growth (PKPs) — Europe and World

MIDDLE EAST

The Region in 1994

Table 6-4. Scheduled traffic — airlines of the Middle East

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	18 000	5.2	5.3	33 330	8.2	2.8
Passenger-kilometres performed (millions)	51 810	5.9	4.6	62 190	6.5	3.0
Freight and mail tonne-kms performed (millions)	3 340	16.0	5.0	3 420	5.5	4.2

Source: ICAO Air Transport Reporting Form A-1.

Economic Trends

6.29 Over the 1983-1993 period, the aggregate Middle East economy (GDP) grew at an average annual rate of 1.9 per cent in real terms, although GDP per capita fell at 1.6 per cent per annum. The oil-producing countries in the region suffered from declines in crude oil prices during the 1980s and from the effects of the Gulf War in 1990-1991. With a return to political and economic stability in the region, GDP growth recovered quite strongly in 1992 and moderate growth was achieved in the following two years. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-13.

6.30 Prospects for this region are particularly dependent on oil market developments and fiscal consolidation policies. A generally improved economic outlook is expected, with forecast GDP growth rates of 4 per cent, 5 per cent and 5 per cent for 1995, 1996 and 1997, respectively.

Airline Financial Trends

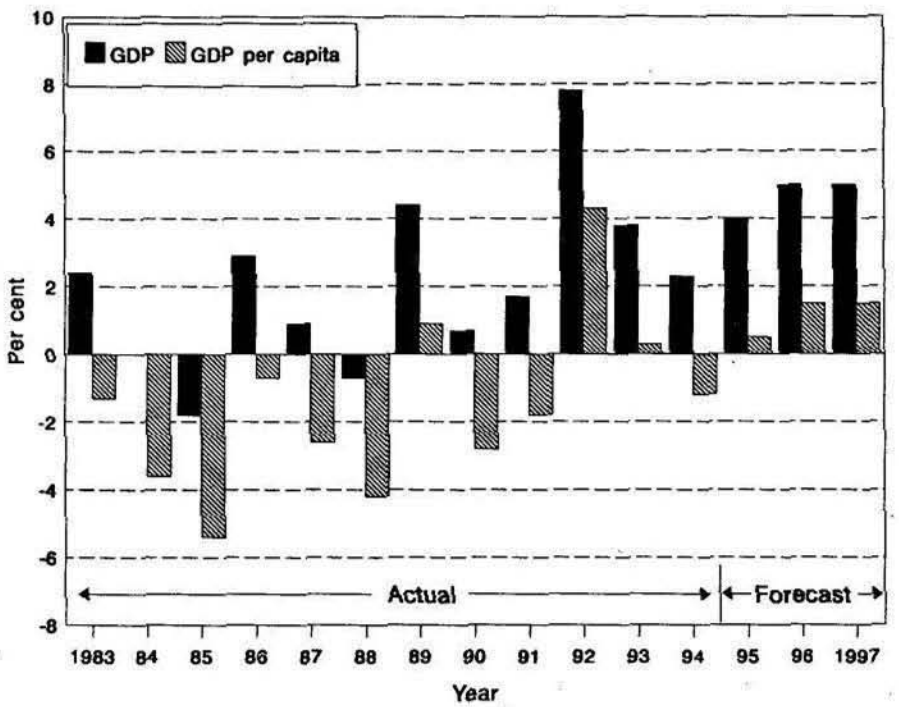
6.31 Over the 1983-1993 period, operating revenues of the scheduled airlines of the Middle East region increased at an average annual rate of 3.6 per cent (compared with the world annual average of 8.7 per cent). Operating expenses for the same period increased by 3.7 per cent per annum. As shown in Figure 6-14, the region experienced two years of operating losses over the period.

6.32 For the 1983-1993 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 5.1 per cent in real terms (compared with a 1.9 per cent decline for the world). It is estimated that real yield changed very little in 1994. The year-to-year comparisons of the changes in real passenger yield of Middle East and world airlines are illustrated in Figure 6-15.

Airline Passenger Traffic Trends and Forecast

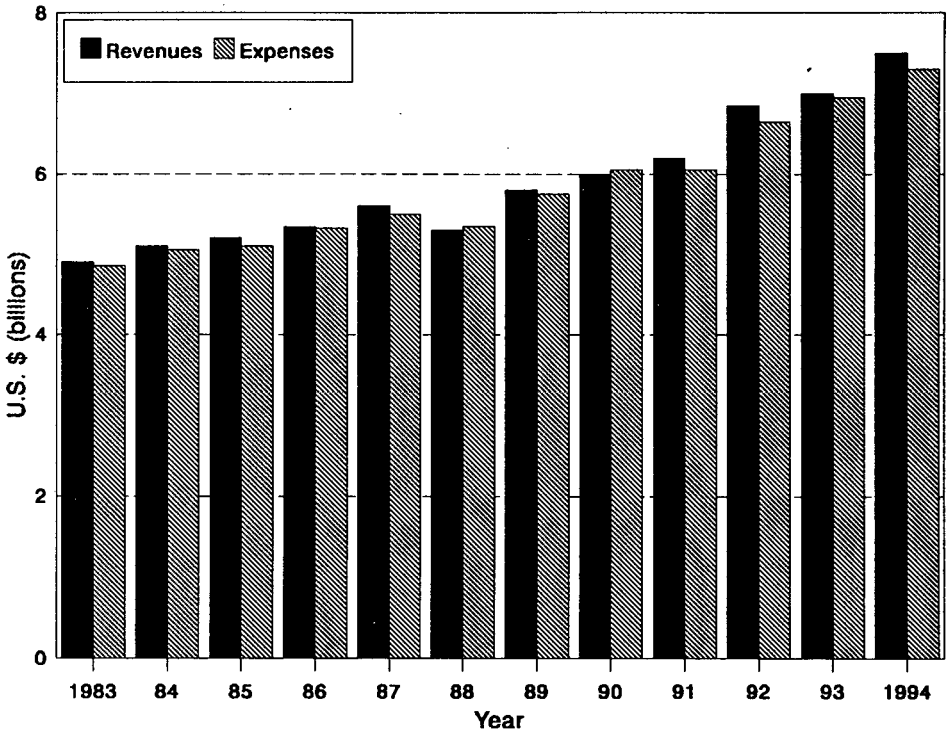
6.33 Over the 1983-1993 period, scheduled passenger traffic (passenger-kilometres performed) of the airlines of the Middle East region increased at an average annual rate of 4.4 per cent (compared with the world annual average of 5.1 per cent). After declines in 1990 and 1991 associated primarily with the Gulf War, traffic recovered strongly in 1992 and maintained a good growth performance in the following two years. The year-to-year traffic growth comparison between world and Middle East airlines is shown in Figure 6-16.

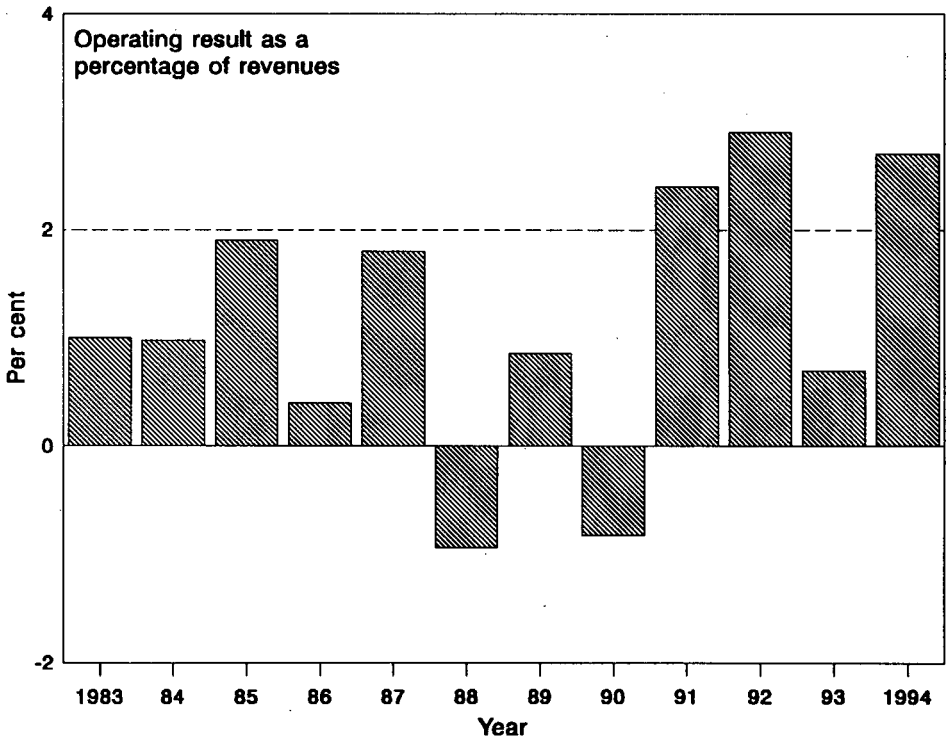
6.34 As shown in Table 5-6 of Chapter 5 and illustrated in Figure 6-16, scheduled passenger traffic for the airlines of the Middle East region is expected to increase by 6.5 per cent per annum over the forecast period to 1997. This rate is higher than achieved during most of the 1980s and reflects an improved economic performance.



Source: IMF, Wharton Econometrics Services.

Figure 6-13. Annual change in real GDP and GDP per capita — Middle East

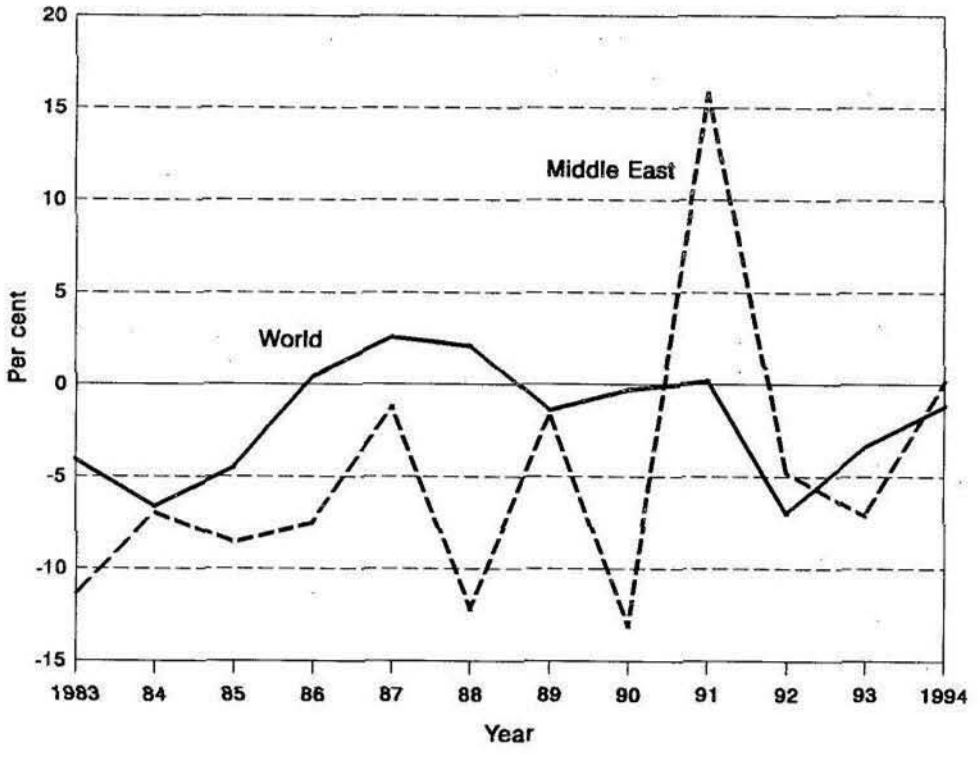




Note.— 1994 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-14. Scheduled airline operating revenues and expenses — Middle East



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-15. Annual change in real scheduled passenger yield — Middle East and World

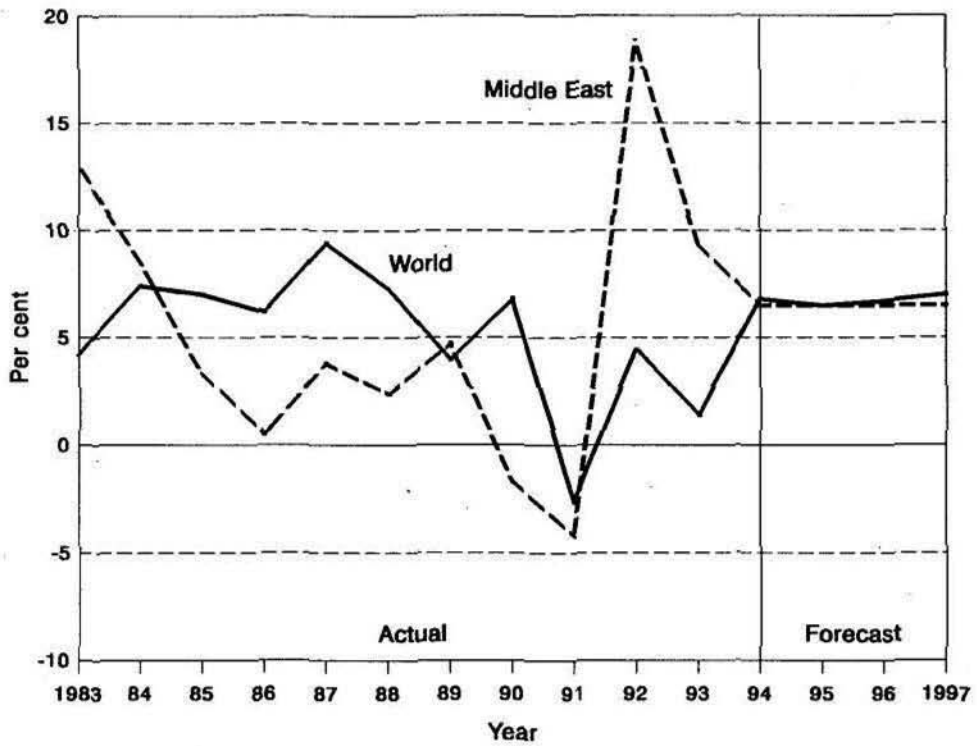


Figure 6-16. Scheduled passenger traffic growth (PKPs) — Middle East and World

NORTH AMERICA

The Region in 1994

Table 6-5. Scheduled traffic — airlines of North America

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	59 700	4.4	17.6	522 380	7.2	43.4
Passenger-kilometres performed (millions)	256 240	4.7	22.5	863 470	6.1	41.4
Freight and mail tonne-kms performed (millions)	12 520	19.5	18.9	23 890	14.1	29.1

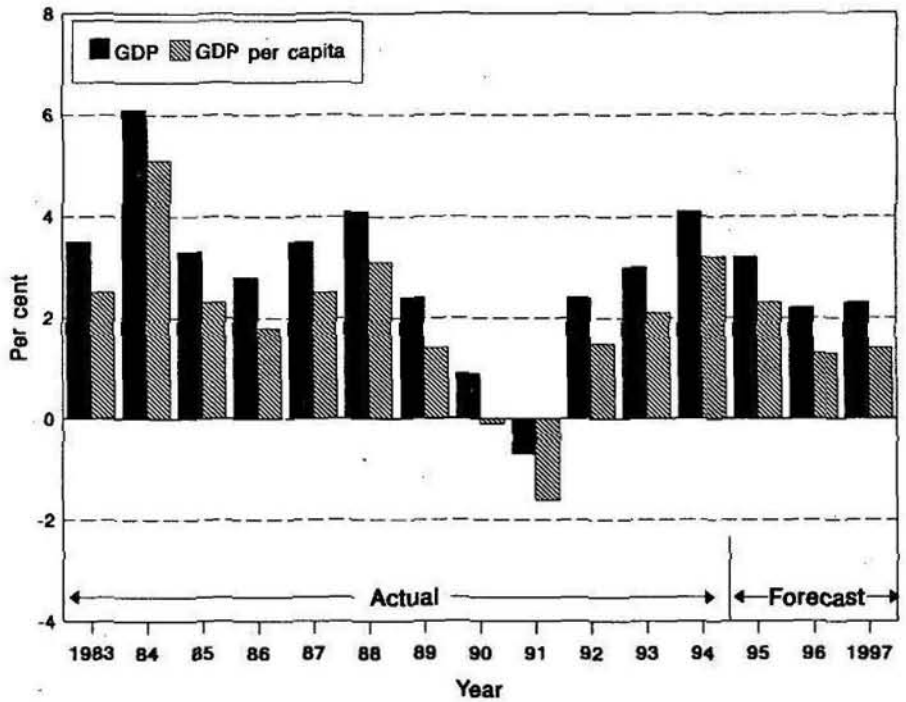
Source: ICAO Air Transport Reporting Form A-1.

6.35 As indicated in Chapter 2, in November the United States announced a new international aviation policy. After several efforts over a number of years to redefine their aviation relationship, Canada and the United States announced in December a framework for a new, less restrictive bilateral agreement. Transnational co-operative alliances with carriers from other regions were an important feature in this region in 1994.

Economic Trends

6.36 Over the 1983-1993 period, the aggregate North American economy (GDP) grew at an average annual rate of 2.8 per cent in real terms, and GDP per capita increased at 1.8 per cent per annum. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-17.

6.37 Recovery from the recession in the United States economy began in 1992 and gained momentum in the following years. Canadian recovery lagged behind that of the United States but was under way by 1993. Real growth in the North American economy was estimated to be about 4 per cent in 1994. North American GDP is expected to grow at 3.2 per cent, 2.2 per cent and 2.3 per cent in 1995, 1996 and 1997, respectively.



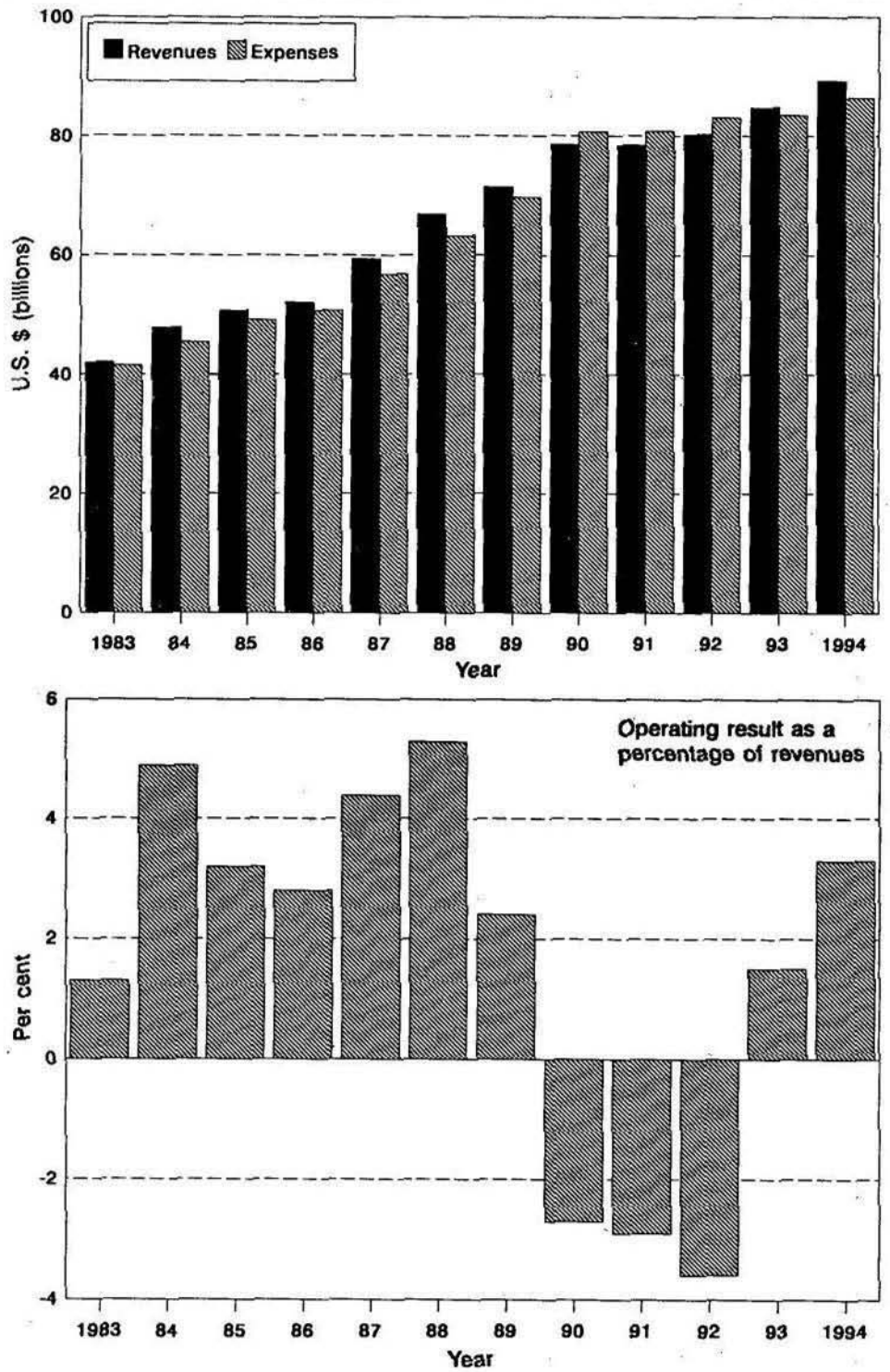
Source: IMF, Wharton Econometrics Services.

Figure 6-17. Annual change in real GDP and GDP per capita — North America

Airline Financial Trends

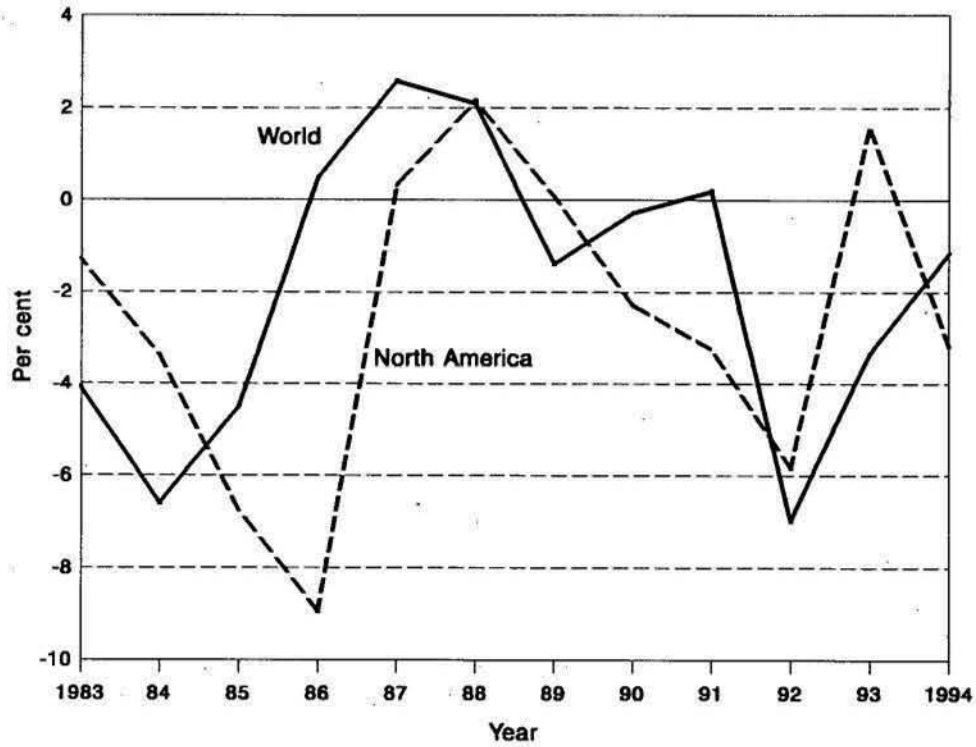
6.38 Over the 1983-1993 period, operating revenues of the scheduled airlines of the North American region increased at an average annual rate of 7.3 per cent (compared with the world annual average of 8.7 per cent). Operating expenses for the same period increased by 7.2 per cent per annum. The string of operating surpluses in the 1983 to 1989 period gave way to serious deficits in 1990, 1991 and 1992 as illustrated in Figure 6-18. Operating surpluses were earned in 1993 and 1994.

6.39 For the 1983-1993 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 2.7 per cent in real terms (compared with a 1.9 per cent decline for the world). Real yield is estimated to have declined by about 3 per cent in 1994. The year-to-year comparisons of the changes in real passenger yield of North American and world airlines are illustrated in Figure 6-19. In general, the passenger yields achieved by the region's airlines were lower than the world average.



Note.— 1994 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-18. Scheduled airline operating revenues and expenses — North America



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-19. Annual change in real scheduled passenger yield — North America and World

Airline Passenger Traffic Trends and Forecast

6.40 Over the 1983-1993 period, scheduled passenger traffic (passenger-kilometres performed) of the airlines of the North American region increased at an average annual rate of 5.4 per cent (compared with the world average of 5.1 per cent). Solid traffic growth, estimated at about 6 per cent, was achieved in 1994, fostered by the buoyant economic growth. The year-to-year traffic growth comparison between world and North American airlines is shown in Figure 6-20.

6.41 As shown in Table 5-6 of Chapter 5 and illustrated in Figure 6-20, scheduled passenger traffic for the airlines of the North American region is expected to increase by 5.5 per cent in both 1995 and 1996, and 5.7 per cent in 1997. These rates are slightly below the expected growth pattern for the world as a whole (6.5, 6.7 and 7 per cent).

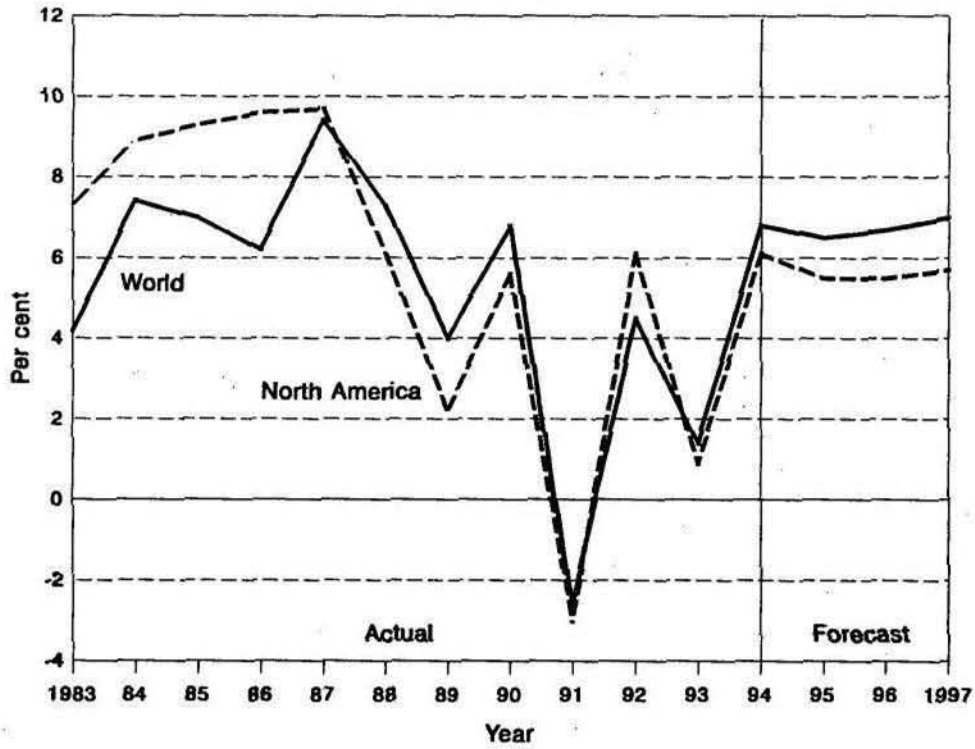


Figure 6-20. Scheduled passenger traffic growth (PKPs) — North America and World

LATIN AMERICA AND THE CARIBBEAN

The Region in 1994

Table 6-6. Scheduled traffic — airlines of Latin America and the Caribbean

	INTERNATIONAL			TOTAL		
	1994	Increase over 1993 (%)	Share of world traffic (%)	1994	Increase over 1993 (%)	Share of world traffic (%)
Passengers carried (thousands)	25 000	6.1	7.4	72 530	6.0	6.0
Passenger-kilometres performed (millions)	65 950	7.3	5.8	102 750	6.9	4.9
Freight and mail tonne-kms performed (millions)	2 970	8.7	4.5	3 620	4.7	4.4

Source: ICAO Air Transport Reporting Form A-1.

6.42 As indicated in Chapters 2 and 3, partial or full privatization of airlines and airports was an important feature in this region during 1994.

6.43 With the implementation of the Treaty of Asuncion (MERCOSUR), preferential treatment is being given by the custom authorities of the countries adhering to the Treaty (Argentina, Brazil, Paraguay and Uruguay) to their nationals when entering their respective territories.

Economic Trends

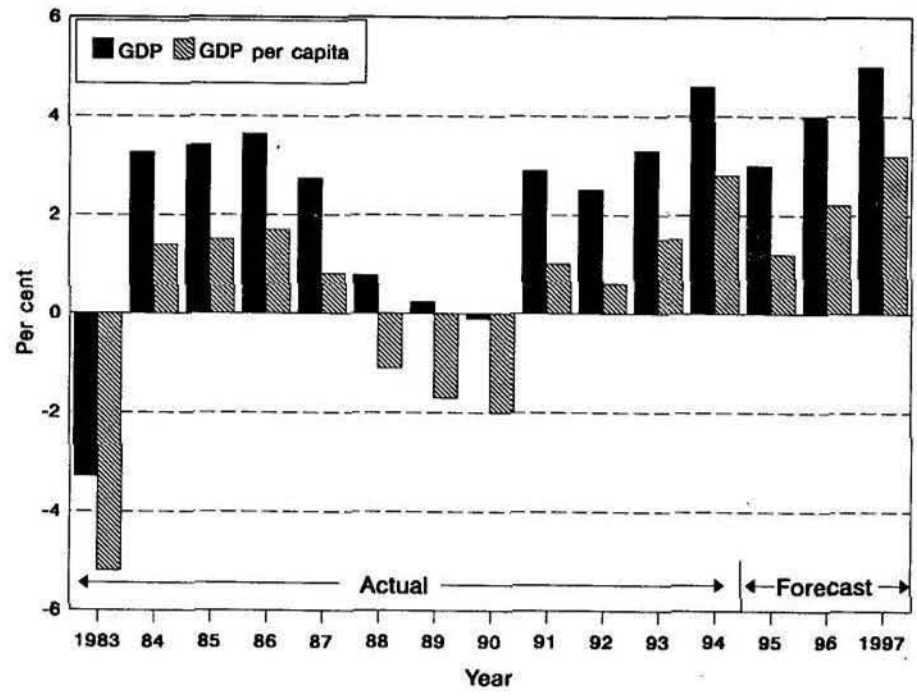
6.44 Over the 1983-1993 period, the aggregate Latin America/Caribbean economy (GDP) grew at an average annual rate of 2.3 per cent in real terms, although GDP per capita grew only at 0.2 per cent. The economy in this region has been severely affected by recessions in the early and late 1980s. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-21.

6.45 Trade liberalization and fiscal and structural reforms in the region have contributed to improved economic growth since 1990. Economic growth was estimated at a robust 4.6 per cent in 1994. The outlook for 1995 is less positive, in the wake of a financial crisis in Mexico, but the longer-term prospects are encouraging. GDP for the region is forecast to grow at 3 per cent, 4 per cent and 5 per cent in 1995, 1996 and 1997, respectively.

Airline Financial Trends

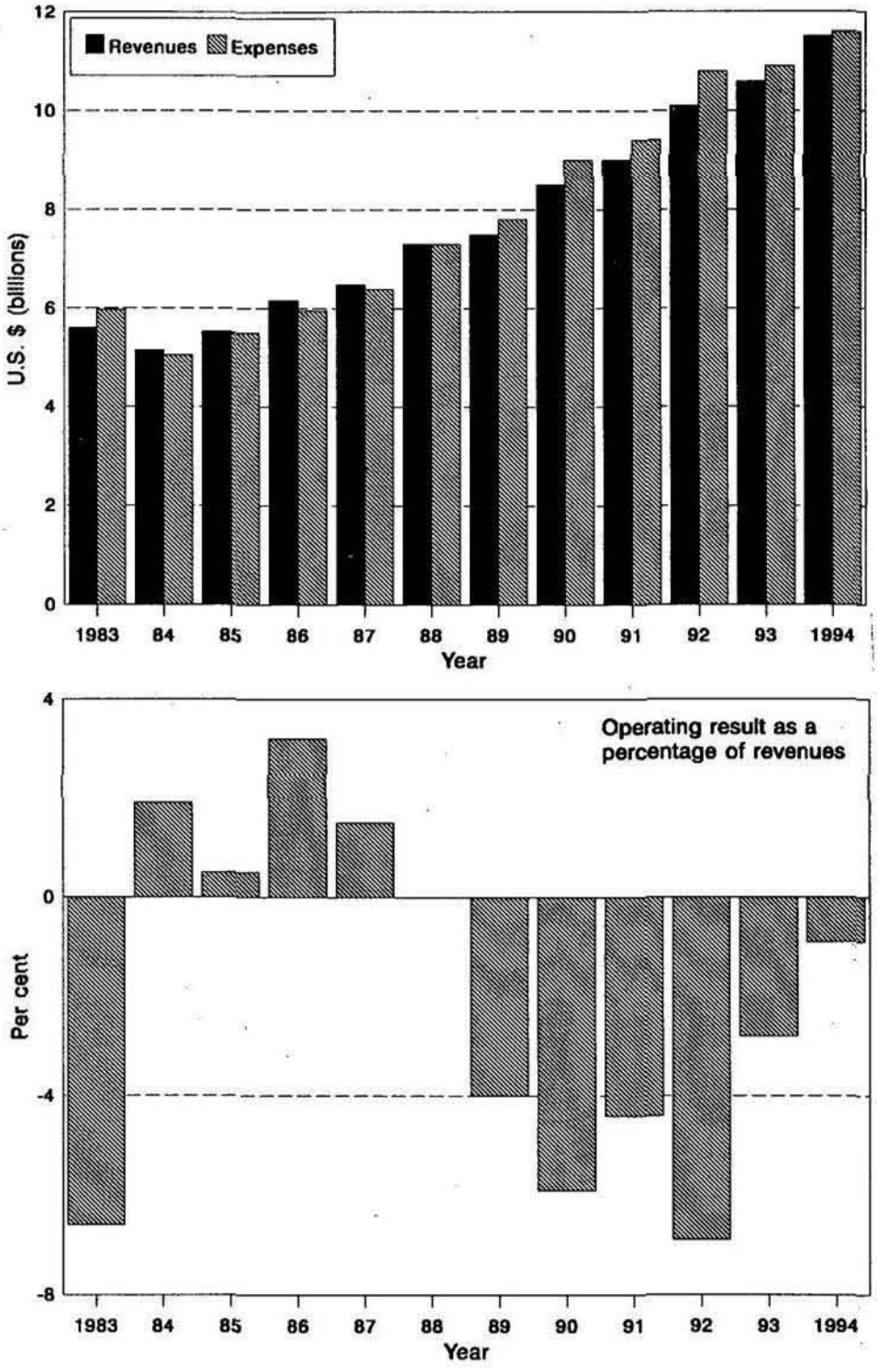
6.46 Over the 1983-1993 period, operating revenues of the scheduled airlines of the Latin America/Caribbean region increased at an average annual rate of 6.6 per cent (compared with the world annual average of 8.7 per cent). Operating expenses for the same period increased by 6.2 per cent per annum. Operating losses were incurred in six of the years following 1982, with modest operating surpluses being achieved in the mid-1980s when general economic conditions were relatively buoyant, as illustrated in Figure 6-22. It is estimated that the losses continued into 1994.

6.47 For the 1983-1993 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 2 per cent in real terms (compared with a 1.9 per cent decline for the world). The year-to-year comparisons of the changes in real passenger yield of Latin America/Caribbean and world airlines are illustrated in Figure 6-23.



Source: IMF, Wharton Econometrics Services.

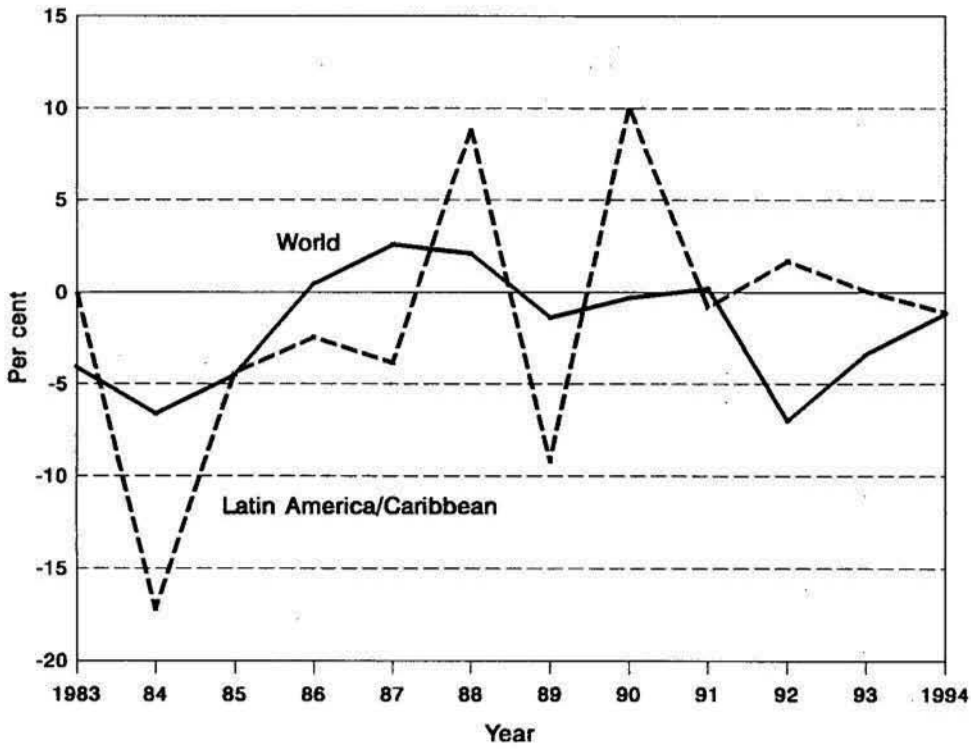
Figure 6-21. Annual change in real GDP and GDP per capita — Latin America/Caribbean



Note.— 1994 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-22. Scheduled airline operating revenues and expenses — Latin America/Caribbean



Notes: — *1994 figures are from estimated data.*
— *Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.*

Source: ICAO Air Transport Reporting Forms A-1 and EF-1.

Figure 6-23. Annual change in real scheduled passenger yield — Latin America/Caribbean and World

Airline Passenger Traffic Trends and Forecast

6.48 Over the 1983-1993 period, the scheduled passenger traffic (passenger-kilometres performed) of airlines of the Latin America/Caribbean region increased at an average annual rate of 4.8 per cent (compared with the world annual average of 5.1 per cent). Traffic grew by a healthy 7 per cent in 1994 (estimated). This was supported by the good economic performance mentioned above. The year-to-year traffic growth comparison between world and Latin America/Caribbean airlines is shown in Figure 6-24.

6.49 As shown in Table 5-6 of Chapter 5 and illustrated in Figure 6-24, and in response to expectations regarding economic performance, scheduled passenger traffic of the airlines of the Latin America/Caribbean region is forecast to increase at 5 per cent, 6 per cent and 7 per cent in 1995, 1996 and 1997, respectively, which is a little below the expected growth pattern over this period for the world as a whole (6.5, 6.7 and 7 per cent).

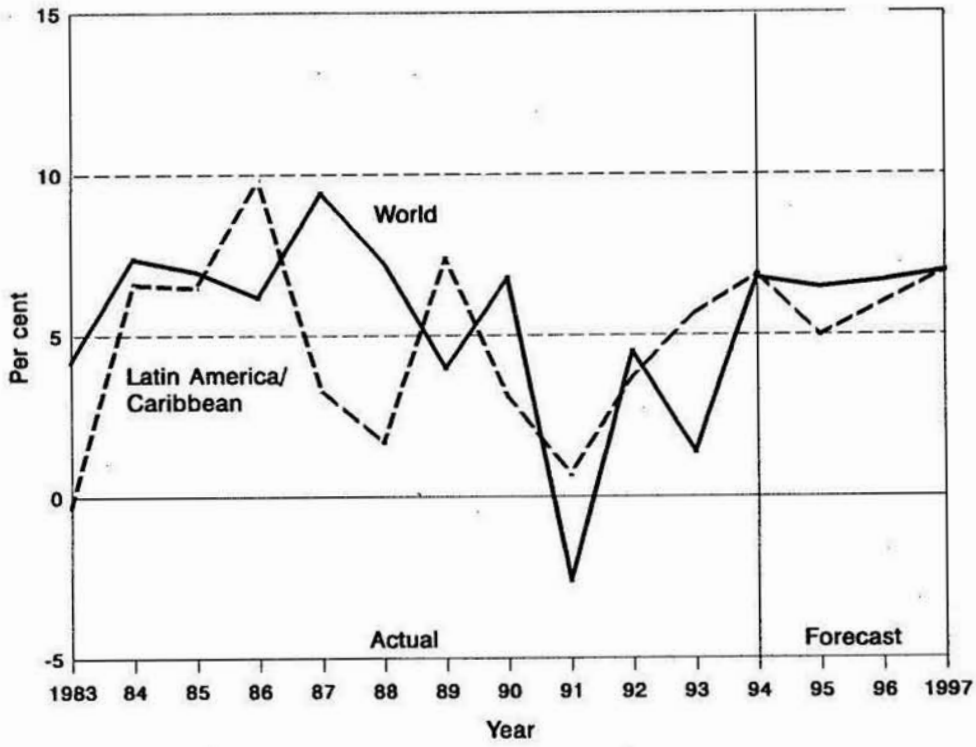


Figure 6-24. Scheduled passenger traffic growth (PKPs) — Latin America/Caribbean and World

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APPENDICES

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Appendix 1
Statistical Tables

Table A1-1. Regional distribution of scheduled traffic — 1994

By ICAO statistical region of airline registration	Aircraft kilometres (millions)	Aircraft departures (thousands)	Passengers carried (thousands)	*Passenger-kilometres performed (millions)*	*Passenger load factor (%)*	Tonne-kilometres performed		*Tonne-kilometres available (millions)*	*Weight load factor (%)*
						Freight (millions)	Total (millions)		
Total (international and domestic) services of airlines of ICAO Contracting States									
Europe (not including CIS*)	3 541	3 894	239 000	437 674	68	21 658	63 895	95 680	67
Percentage of world traffic	19.9	23.6	19.9	21.0		28.3	23.5	20.9	
Commonwealth of Independent States	899	706	37 255	83 824	63	851	8 466	14 648	58
Percentage of world traffic	5.0	4.3	3.1	4.0		1.1	3.1	3.2	
Europe	4 440	4 600	276 255	521 498	67	22 509	72 361	110 328	66
Percentage of world traffic	24.9	27.9	23.0	25.0		29.4	26.6	24.1	
Africa	459	428	25 190	45 728	60	1 530	5 665	11 080	51
Percentage of world traffic	2.6	2.6	2.1	2.2		2.0	2.1	2.4	
Middle East	474	353	33 330	62 193	65	3 330	9 079	15 917	57
Percentage of world traffic	2.7	2.1	2.8	3.0		4.3	3.3	3.5	
Asia and Pacific	3 205	2 637	273 500	490 460	67	25 153	69 236	114 940	60
Percentage of world traffic	18.0	16.0	22.7	23.5		32.9	25.5	25.2	
North America	8 137	7 105	522 384	863 467	66	20 500	102 236	181 287	56
Percentage of world traffic	45.6	43.0	43.4	41.4		26.8	37.7	39.7	
Latin America and Caribbean	1 110	1 392	72 530	102 754	61	3 508	12 923	23 395	55
Percentage of world traffic	6.2	8.4	6.0	4.9		4.6	4.8	5.1	
Total	17 825	16 515	1 203 189	2 086 100	66	76 530	271 500	456 947	59
International services of airlines of ICAO Contracting States									
Europe (not including CIS)*	*2 840*	*2 073*	*140 000*	*375 500*	*69*	*21 260*	*57 670*	*84 970*	*68*
Percentage of world traffic	37.0	52.4	41.2	33.1		33.2	33.6	31.0	
Commonwealth of Independent States	188	62	4 170	15 219	55	499	1 879	3 760	50
Percentage of world traffic	2.5	1.6	1.2	1.3		0.8	1.1	1.4	
Europe	3 028	2 135	144 170	390 719	68	21 759	59 549	88 730	67
Percentage of world traffic	39.5	53.9	42.4	34.4		34.0	34.8	32.3	
Africa	334	180	12 800	37 522	60	1 420	4 820	9 340	52
Percentage of world traffic	4.4	4.6	3.8	3.3		2.2	2.8	3.4	
Middle East	384	183	18 000	51 809	64	3 254	8 086	13 957	58
Percentage of world traffic	5.0	4.6	5.3	4.6		5.1	4.7	5.1	
Asia and Pacific	*1 720*	*517*	*80 000*	*333 863*	*68*	*22 971*	*54 293*	*86 200*	*63*
Percentage of world traffic	22.4	13.1	23.5	29.4		35.8	31.6	31.4	
North America	1 640	563	59 702	256 242	70	11 762	35 775	60 367	59
Percentage of world traffic	21.4	14.2	17.6	22.5		18.3	20.8	22.0	
Latin America and Caribbean	560	380	25 000	65 945	63	2 924	9 157	15 780	58
Percentage of world traffic	7.3	9.6	7.4	5.8		4.6	5.3	5.8	
Total	7 666	3 958	339 672	1 136 100	68	64 090	171 680	274 374	63

* Commonwealth of Independent States

Source.— ICAO Air Transport Reporting Form A-1.

Table A1-2. Number of turbo-jet and turboprop aircraft delivered, ordered and remaining to be delivered up to 31 December 1994[1]
(commercial operators of ICAO Contracting States)

Type of aircraft	Before 1994	Delivered during 1994	Total as of 31/12/94	Ordered during 1994[2]	Remaining to be delivered as of 31/12/94[3]
TURBO-JETS					
Airbus Industrie A-300	406	23	429	—	41
Airbus Industrie A-310	243	2	245	—	9
Airbus Industrie A-319	—	—	—	45	51
Airbus Industrie A-320	433	48	481	15	177
Airbus Industrie A-321	—	16	16	—	131
Airbus Industrie A-330	1	9	10	—	108
Airbus Industrie A-340	21	24	45	28	97
Boeing 737	2 538	121	2 659	70	391
Boeing 747	991	40	1 031	16	111
Boeing 757	581	69	650	12	182
Boeing 767	519	40	559	22	128
Boeing 777	—	—	—	—	147
British Aerospace — 146/RJ 85/100	220	22	242	25	31
Canadair Regional Jet	25	26	51	40	53
Fokker 100	226	33	259	11	15
Fokker 70	—	1	1	18	39
McDonnell-Douglas MD-80/90	1 089	22	1 111	1	122
McDonnell-Douglas MD-11	112	17	129	3	45
Total of aircraft in production	7 405	513	7 918	306	1 878
Total of aircraft not in production[4]	5 963	—	5 963	—	—
Total turbo-jets	13 368	513	13 881	306	1 878
TURBOPROPS					
Aerospatiale/Aeritalia ATR-42/72	362	48	410	27	25
British Aerospace ATP	52	1	53	3	5
British Aerospace Jet Stream 41	17	15	32	67	62
DeHavilland Canada DHC-8	360	29	389	20	24
Dornier DO-328	3	18	21	36	55
Embraer EMB-120 Brasilia	278	7	285	5	32
Fokker 50	170	17	187	21	14
SAAB SF-340	351	10	361	—	29
SAAB 2000	—	5	5	—	31
Total of aircraft in production	1 593	150	1 743	175	279
Total of aircraft not in production[4]	2 560	—	2 560	—	—
Total turboprops	4 153	150	4 303	179	277

1. The numbers given are estimated on the basis of information supplied by aircraft manufacturers; in many instances, numbers for past years have been revised; owing to lack of information, the aircraft manufactured in the CIS are not included in this table.
2. The numbers do not include options by commercial operators for transport aircraft.
3. The numbers in this column take into account cancellations during the year.
4. These figures are the cumulative totals of deliveries for aircraft types no longer in production after 1993.

Table A1-3. Aircraft accidents involving passenger fatalities on scheduled air services, 1975-1994

Year	Aircraft accidents	Passengers killed	Passenger fatalities per 100 million passenger-km	Passenger fatalities per 100 million passenger-miles	Fatal accidents per 100 million km flown	Fatal accidents per 100 million miles flown	Fatal accidents per 100 000 aircraft hours	Fatal accidents per 100 000 aircraft landings
Excluding the Commonwealth of Independent States								
1975	21	467	0.08	0.13	0.28	0.45	0.17	0.22
1976	20[1]	734	0.12	0.19	0.26	0.41	0.15	0.20
1977	24	516	0.07	0.12	0.30	0.48	0.18	0.24
1978	25	754	0.09	0.15	0.29	0.47	0.18	0.24
1979	31	877	0.10	0.16	0.34	0.55	0.21	0.29
1980	22	814	0.09	0.14	0.24	0.38	0.15	0.21
1981	21	362	0.04	0.06	0.23	0.37	0.14	0.20
1982	26	764	0.08	0.13	0.28	0.46	0.18	0.25
1983	20[2]	809	0.08	0.13	0.21	0.34	0.13	0.18
1984	16	223	0.02	0.03	0.16	0.26	0.10	0.14
1985	22	1 066	0.09	0.15	0.21	0.34	0.13	0.19
1986	17	331	0.03	0.04	0.15	0.24	0.09	0.14
1987	24	890	0.06	0.10	0.20	0.32	0.12	0.18
1988	25	699	0.05	0.08	0.19	0.31	0.12	0.18
1989	27	817	0.05	0.08	0.20	0.32	0.12	0.19
1990	22	440	0.03	0.04	0.15	0.25	0.09	0.15
1991	25[3]	510	0.03	0.05	0.18	0.28	0.11	0.18
1992	25	990	0.06	0.09	0.16	0.26	0.10	0.17
1993	31	801	0.04	0.07	0.19	0.31	0.12	0.21
1994	24	732	0.04	0.06	0.14	0.23	0.09	0.15
Including the Commonwealth of Independent States								
1986	22	546	0.04	0.06	na	na	na	na
1987	26	901	0.06	0.09	na	na	na	na
1988	28	729	0.04	0.07	na	na	na	na
1989	27	817	0.05	0.07	na	na	na	na
1990	25	495	0.03	0.04	na	na	na	na
1991	30[3]	653	0.04	0.06	na	na	na	na
1992	29	1 097	0.06	0.09	na	na	na	na
1993	34	936	0.05	0.08	na	na	na	na
1994	28	941	0.05	0.07	na	na	na	na

1. Includes one mid-air collision shown here as one accident.
2. Includes one collision on the ground shown here as one accident.
3. Includes one collision on the ground shown here as two accidents.

na not available

Source.— ICAO Air Transport Reporting Form G and other reports.

Table A1-4. Aviation security

Year	Number of acts of unlawful interference	Number of acts of unlawful seizure		Number of acts of sabotage	Other acts*	Number of persons injured or killed during acts of unlawful interference	
		Attempted seizures	Actual seizures			Injured	Killed
1975	47	11	12	24	—	217	92
1976	54	13	13	28	—	215	218
1977	65	16	18	31	—	71	133
1978	37	13	13	11	—	22	59
1979	37	10	16	11	—	194	64
1980	54	17	29	8	—	39	72
1981	53	14	24	15	—	39	8
1982	36	11	19	6	—	119	14
1983	45	17	21	7	—	70	15
1984	41	7	21	13	—	249	68
1985	40	7	20	13	—	243	473
1986	14	6	5	3	—	235	112
1987	13	6	4	3	—	121	166
1988	12	3	7	2	—	21	300
1989	14	4	8	2	—	38	278
1990	36	12	20	1	3	145	137
1991	15	5	7	0	3	2	0
1992	10	2	6	0	2	123	10
1993	30	4	21	0	5	2	28
1994	31	3	19	2	7	29	53

* Includes missile and facility attacks.

Appendix 2
Methodology for Traffic Forecasts

1. Short- or medium-term air transport forecasting methods depend heavily on careful analysis of recent trends in the aviation industry and of the operating environment as well as economic and demographic factors affecting air travel and the cost of air travel itself.

2. As a basis for the development of traffic forecasts, econometric analyses were carried out which established a relationship between passenger traffic demand, GDP, GDP/capita and airline yields. Several econometric models were developed at global and regional levels. While at a global level, these models appear to provide reasonably robust results, they have been less adequate at the regional level.

3. Based on forecasts of economic developments and expectations of yield, traffic forecasts for the years 1995, 1996 and 1997 were estimated using the econometric models. The forecast traffic growth rates were then reviewed in the light of recent trends in the airline operating environment and prospective changes in other factors which could not be accommodated in the econometric analyses.

4. The basic model form used for the global analysis is described below:

$$y = a \cdot x_1^{b_1} \cdot x_2^{b_2}$$

where:

y = passenger-kilometres performed (PKP)

x_1 = gross domestic product in real terms (GDP)

x_2 = passenger revenue per passenger-kilometre in real terms (PYIELD)

5. The a, b_1 and b_2 are constant coefficients whose values were obtained by statistical estimation procedures using econometric analysis; b_1 and b_2 are equal to the elasticities of demand with respect to corresponding x_1 (GDP) and x_2 (PYIELD), i.e. elasticities of income and price.

6. Using logarithmics, the above relationship was transformed into the equivalent linear relationship $ln\ y = a + b_1 lnx_1 + b_2 lnx_2$. Annual data covering a period of 33 years were used in the subsequent econometric (least squares regression) analysis, with the following results at the global level.

$$ln\ PKP = 0.92 + 2.13\ ln\ GDP - 0.60\ ln\ PYIELD \qquad R^2 = 0.999$$
$$(29.9) \qquad (7.1) \qquad S.E. = .025$$

R = coefficient of correlation

S.E. = standard error of the estimate

( ) = "t" values of the corresponding coefficient estimates

— END —

ICAO PUBLICATIONS
IN THE AIR TRANSPORT FIELD

The following summary gives the status and also describes in general terms the contents of the various series of publications in the air transport field issued by the International Civil Aviation Organization:

International Standards and Recommended Practices on Facilitation *(designated as Annex 9 to the Convention)* which are adopted by the Council in accordance with Articles 37, 54 and 90 of the Convention on International Civil Aviation. The uniform observance of the specifications contained in the International Standards on Facilitation is recognized as practicable and as necessary to facilitate and improve some aspect of international air navigation, while the observance of any specification contained in the Recommended Practices is recognized as generally practicable and as highly desirable to facilitate and improve some aspect of international air navigation. Any differences between the national regulations and practices of a State and those established by an International Standard must be notified to the Council in accordance with Article 38 of the Convention. The Council has also invited Contracting States to notify differences from the provisions of the Recommended Practices;

Council Statements on policy relating to air transport questions, such as the economics of airports and en-route air navigation facilities, taxation and aims in the field of facilitation;

Digests of Statistics which are issued on a regular basis, presenting the statistical information received from Contracting States on their civil aviation activities;

Circulars providing specialized information of interest to Contracting States. They include regional studies on the development of international air passenger, freight and mail traffic and specialized studies of a world-wide nature;

Manuals providing information or guidance to Contracting States on such questions as airport and air navigation facility tariffs, air traffic forecasting techniques and air transport statistics.

Also of interest to Contracting States are reports of meetings in the air transport field, such as sessions of the Facilitation Division and the Statistics Division and conferences on the economics of airports and air navigation facilities. Supplements to these reports are issued, indicating the action taken by the Council on the meeting recommendations, many of which are addressed to Contracting States.

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