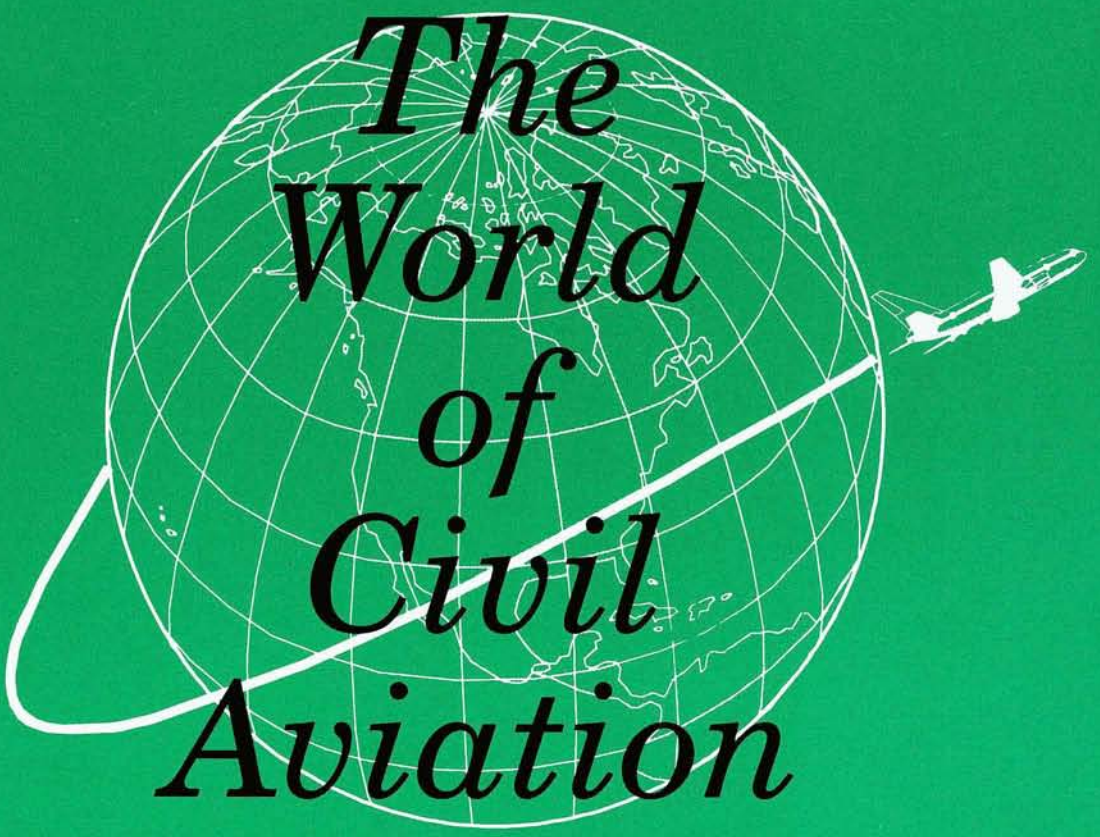
CIRCULAR 271-AT/112



The World of Civil Aviation

1996-1999

Approved by the Secretary General and published under his authority

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Published in separate English, Arabic, French, Russian and Spanish editions by the International Civil Aviation Organization. All correspondence, except orders and subscriptions, should be addressed to the Secretary General.

Orders for this publication should be sent to one of the following addresses, together with the appropriate remittance (by bank draft, cheque or money order) in U.S. dollars or the currency of the country in which the order is placed.

Document Sales Unit
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada H3C 5H7

Telephone: (514) 954-8022
Telex: 05-24513
Facsimile: (514) 954-6769
Sitatex: YULCAYA
Internet: sales_unit@icao.org

Credit card orders (American Express, MasterCard and Visa) are accepted at the above address.

Egypt. ICAO Representative, Middle East Office, Egyptian Civil Aviation Complex, Cairo Airport Road, Heliopolis, Cairo 11776
Telephone: (20 2) 267-4840; Facsimile: (20 2) 267-4843; Sitatex: CAICAYA

France. Représentant de l'OACI, Bureau Europe et Atlantique Nord, 3 *bis,* villa Émile-Bergerat, 92522 Neuilly-sur-Seine (Cedex)
Téléphone: (33 1) 46 41 85 85; Télécopieur: (33 1) 46 41 85 00; Sitatex: PAREUYA

India. Oxford Book and Stationery Co., Scindia House, New Delhi 110001
or 17 Park Street, Calcutta 700016
Telephone: (91 11) 331-5896; Facsimile: (91 11) 332-2639

Japan. Japan Civil Aviation Promotion Foundation, 15-12, 1-chome, Toranomon, Minato-Ku, Tokyo
Telephone: (81 3) 3503-2686; Facsimile: (81 3) 3503-2689

Kenya. ICAO Representative, Eastern and Southern African Office, United Nations Accommodation, P.O. Box 46294, Nairobi
Telephone: (254-2) 622-395; Facsimile: (254 2) 226-706; Sitatex: NBOCAYA

Mexico. Representante de la OACI, Oficina Norteamérica, Centroamérica y Caribe, Masaryk No. 29-3er. piso, Col. Chapultepec Morales, México, D.F., 11570
Teléfono: (52 5) 250-3211; Facsímile: (52 5) 203-2757; Sitatex: MEXCAYA

Peru. Representante de la OACI, Oficina Sudamérica, Apartado 4127, Lima 100
Teléfono: (51 14) 302260; Facsímile: (51 14) 640393; Sitatex: LIMCAYA

Senegal. Représentant de l'OACI, Bureau Afrique occidentale et centrale, Boîte postale 2356, Dakar
Téléphone: (221) 8-23-47-86; Télécopieur: (221) 8-23-69-26; Sitatex: DKRCAYA

South Africa. Avex Air Training (Pty) Ltd., Private Bag X102, Halfway House, 1685, Republic of South Africa
Telephone: (27-11) 315-0003/4; Facsimile: (27-11) 805-3649; Internet: avex@iafrica.com

Spain. A.E.N.A. — Aeropuertos Españoles y Navegación Aérea, Calle Juan Ignacio Luca de Tena, 14, Planta Tercera, Despacho 3. 11, 28027 Madrid
Teléfono: (34 1) 321-3148; Facsímile: (34 1) 321-3157; Internet: sscc.jcsoria@aena.es

Thailand. ICAO Representative, Asia and Pacific Office, P.O. Box 11, Samyaek Ladprao, Bangkok 10901
Telephone: (66 2) 537-8189; Facsimile: (66 2) 537-8199; Sitatex: BKKCAYA

United Kingdom. Wetward Digital Limited, 37 Windsor Street, Cheltenham, Glos., GL52 2DG
Telephone: (44 1242) 235-151; Facsimile: (44 1242) 584-139

2/98

HIGHLIGHTS

DURING 1996 ...

Growth in the world economy was sustained ...

The world's Gross Domestic Product (GDP) grew by an estimated 3.5 per cent in real terms. On a regional basis the change in GDP ranged from an estimated increase of some 5.6 per cent for Asia/Pacific to about 1.4 per cent for Europe (see Chapter 1).

... as was airline traffic growth ...

Over-all scheduled passenger/freight/mail tonne-kilometres performed were up by 7 per cent and international tonne-kilometres by 8 per cent. There were significant differences in the traffic growth between regions, ranging from increases in total traffic of about 5 per cent for carriers based in Europe and in the Middle East to almost 9 per cent for those in Asia/Pacific (Chapter 2).

Airline operating profits softened ...

Preliminary estimates indicate that the world's scheduled airlines as a whole experienced an operating profit — 4.3 per cent of operating revenues compared with 5.1 per cent in 1995 — for the fourth year in succession (Chapter 2).

... but aircraft orders were up ...

The number of turbo-jet aircraft ordered was 1 003 compared to 678 in 1995. The financial commitment for orders placed for these aircraft is estimated to be about U.S.$65 billion, a little less than double the U.S.$36 billion estimated for 1995 (Chapter 2).

Liberalization was fostered through regional agreements ...

The number of bilateral agreements and memoranda of understanding concluded between States was slightly down when compared with 1995 but significantly higher than in 1994. Two new regional agreements to foster more competitive air services were reached; one among some States in the Caribbean and the other among six States in South America (Chapter 2).

THIS PAGE INTENTIONALLY LEFT BLANK

FOREWORD

Introduction

1. This circular, *The World of Civil Aviation — 1996-1999,* is the fifth in an annual series of publications covering recent and future developments in civil aviation; the developments for the previous period 1995-1998 were published in Circular 265. In the present circular, Part I reviews the main events in or affecting international civil aviation in 1996, Part II analyses trends in the world economy and the air transport industry and presents global forecasts of airline scheduled passenger traffic through to 1999, and Part III reviews, on a region-by-region basis, the year 1996 and gives prospects through to 1999.

2. More extensive aviation statistics for 1996 may be found in the ICAO statistical yearbook, *Civil Aviation Statistics of the World, 1996* (Doc 9180/22), a compendium of the key statistics published in the various ICAO Digests of Statistics. Other publications of the Organization which complement and supplement *The World of Civil Aviation* are the studies of *Regional Differences in International Airline Operating Economics* (annual, previously entitled *Regional Differences in Fares, Rates and Costs for International Air Transport*), and the *Surveys of International Air Transport Fares and Rates* (triennial). 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 2005* (Circular 270).

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

International Civil Aviation Organization
Attention: Document Sales Unit
999 University Street
Montreal, Quebec
Canada H3C 5H7

Telephone: (514) 954-8022 SITA: YULADYA
Facsimile: (514) 954-6769 e-mail: sales_unit@icao.org

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 Organisation 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); WEFA Group (formerly known as Wharton Econometrics Forecasting Associates Group); Airclaims Ltd.; and Avmark Inc.

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.

6. The statistical data for 1996 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 (185 at the end of 1996);

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 1999

PART III — REGIONAL PERSPECTIVES, 1996 TO 1999

APPENDICES

PART I

THE WORLD IN 1996

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 1
Economic Influences

1.1 While growth in air traffic has historically been 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 1996, which follows in Chapters 2 to 4, this chapter reviews developments in 1996 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

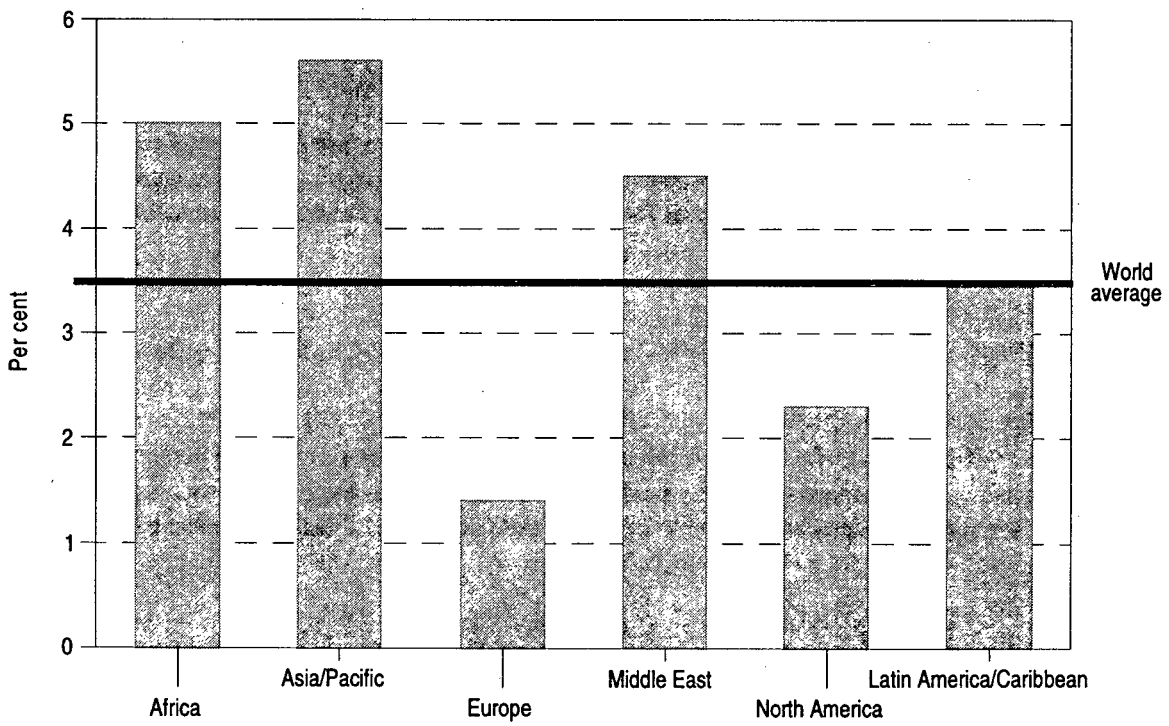
1.4 In 1996 the world's Gross Domestic Product (GDP), which is the broadest available measure of economic activity, grew by an estimated 3.5 per cent. This result masks a wide variation in the economic performance of different regions and States. Over all, the economic outcome was achieved in conditions of stable or improving inflation which bodes well for prospects in the medium term.

1.5 The United States economy accelerated slightly in 1996 after a slowdown in 1995, though Canada's rate of growth slowed. In Western Europe, continued restrictive fiscal policies and relatively high real interest rates resulted in a slowdown in the rate of growth. The Japanese economy, after three years of very low growth, returned to much higher growth in 1996. The average growth over all amongst the "Advanced Economies" remained virtually unchanged.

1.6 In the former centrally planned economies of eastern Europe and the Commonwealth of Independent States (CIS), the process of transition towards market-based economies continued in 1996. Most countries had improved growth or smaller declines in output when compared with experience in recent years.

1.7 Many developing countries in Asia, Africa and the Middle East experienced buoyant economic conditions in 1996. This was especially true of East and South East Asia, where growth of 8-9 per cent was achieved by a number of countries. While the 1996 growth in Asia generally followed good performance in previous years, that of States in Africa and the Middle East frequently represented a significant improvement. Economic performance in Latin America had been adversely affected during 1995 by the consequences of a financial crisis in Mexico and by abrupt declines in the economies of both Mexico and Argentina. In 1996 continued recovery in Mexico and Argentina, and a strong performance by Brazil, led the Latin American region to higher growth after a relatively poor performance in 1995.

1.8 Figure 1-1 illustrates the relative regional economic growth rates in 1996 for the ICAO statistical regions. It is important to appreciate that many assumptions (particularly concerning the weighting process) are embodied in both the global and regional estimates.



Source: ICAO estimates based on the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF), WEFA Group and other economic sources.

Figure 1-1. Annual change in real GDP, 1996/1995

1.9 The diverse economic experience around the world was a factor in wide variations in air carrier traffic development in 1996, illustrated particularly by the contrast between buoyant economic and traffic performance in much of the Asia/Pacific, Middle East, Latin American and African regions and declines in the CIS. While the general 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

1.10 After two years of strong growth in 1994 and 1995, the rate of growth in the volume of world trade in goods and services slowed to about 5.6 per cent in 1996 (compared with 8.7 per cent in 1995). As in previous years this growth was much higher than the rate of growth for GDP, reflecting the liberalization of international trading and financial relationships and the process of globalization. The exports of industrial countries (as a group), developing countries and countries in transition towards market-based economies all expanded vigorously, and there was also a rapid expansion of trade in services, notably in 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.

1.11 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, 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.

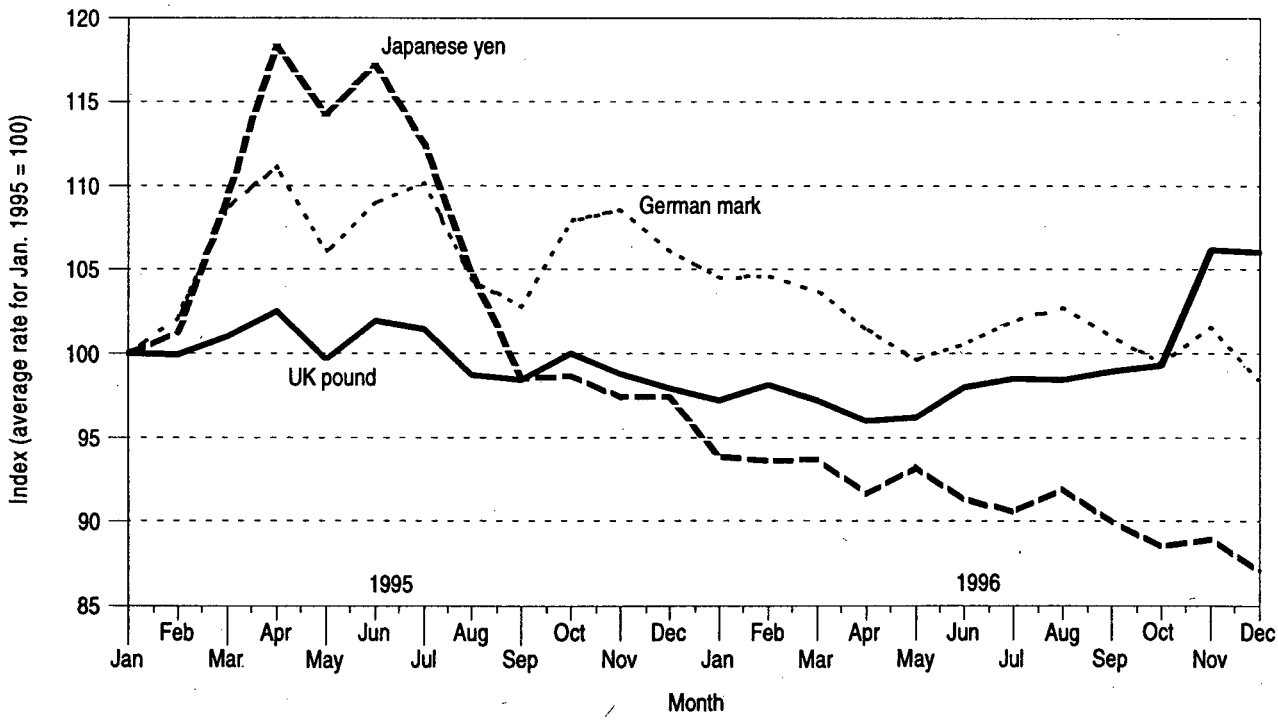
TOURISM

1.12 The demand for international air travel is related in part to the demand for international tourism. Preliminary estimates of the World Tourism Organization (WTO) indicate that international tourist arrivals grew by 4.6 per cent and tourist receipts by 7.6 per cent in 1996 (compared with 3.8 per cent and 7.2 per cent respectively in 1995). These global rates are affected by the relatively modest performance of the large markets of Europe (3.6 per cent growth in arrivals) and North America (4.3 per cent growth in arrivals). The smaller markets of East Asia/Pacific (8.3 per cent growth in arrivals) and the Middle East (10.5 per cent growth in arrivals) again experienced more rapid growth in 1996.

1.13 There is a tendency for tourist travel to be growing particularly rapidly in long-haul markets, which is favourable for the air travel industry. Furthermore, the flexibility of air transport is facilitating the development of new tourist markets involving ever greater numbers of countries.

INFLATION, INTEREST RATES AND CURRENCY MARKETS

1.14 The average rate of inflation in industrial countries remained very low at about 2 per cent in 1996. In this environment, cost pressures on the airlines of the developed world were subdued. On the other hand, inflation was generally higher in developing countries in 1996, with a weighted average of 20 per cent in Latin America, 25 per cent in Africa and 7 per cent in Asia. Inflation was even higher in some of the countries in transition to market-based economies, although significant improvements were achieved for the second year in succession.



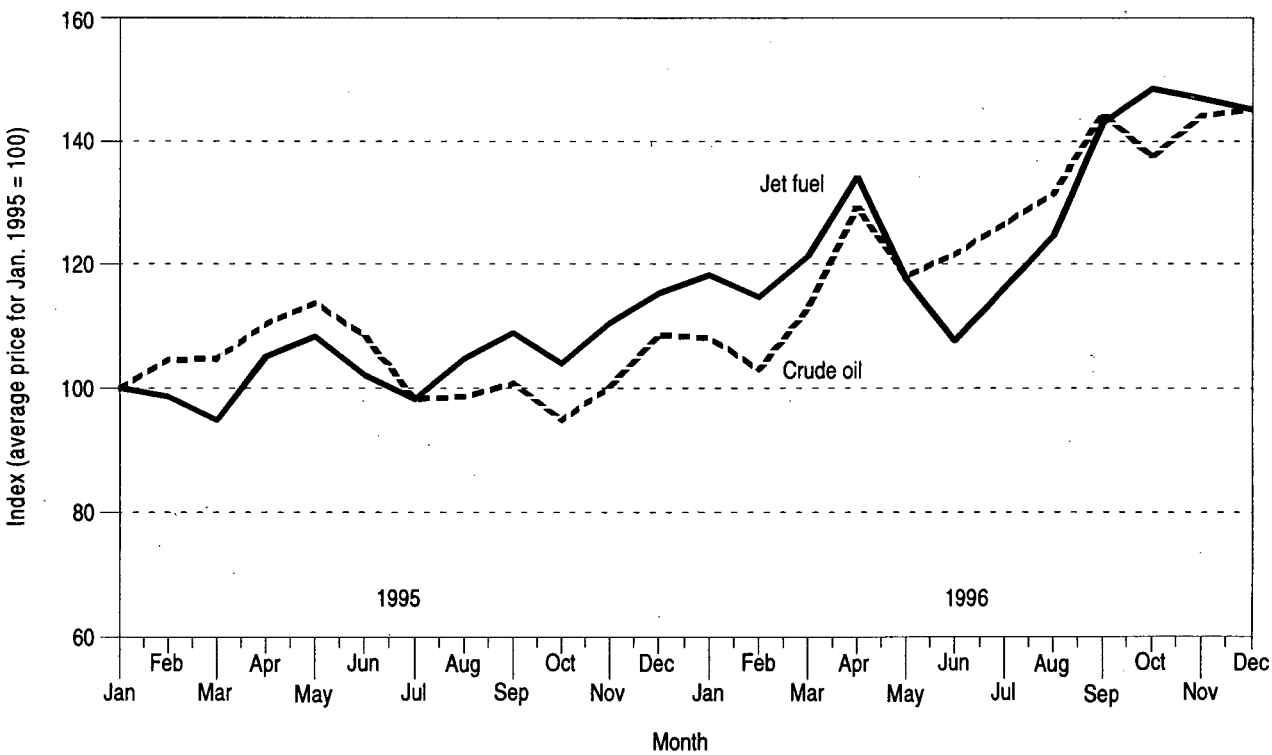
Source: IATA five-day rates.

Figure 1-2. Currency variations with respect to the U.S. dollar
(January 1995 to December 1996)

1.15 Short-term interest rates, which reflect the stance of monetary policy, generally declined during 1996 in industrialized countries, in response to a weakness in aggregate demand and economic activity. Long-term interest rates generally also fell during 1996. Interest rates are quite low by the standards of past years, which is a favourable factor for the cost of borrowing for civil aviation.

1.16 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 German mark and the Japanese yen both fell slowly but steadily against the U.S. dollar during 1996, while the U.K. pound remained fairly stable until it rose sharply by about 7 per cent in November (Figure 1-2).

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



Source: Petroleum Economist and the Journal of Commerce.

Figure 1-3. Trends in crude oil and jet fuel prices
(January 1995 to December 1996)

1.18 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 the airline's debt denominated in a depreciated foreign currency.

CRUDE OIL AND JET FUEL

1.19 In 1996, the fuel market experienced a significant and lengthy increase in the price of crude oil and jet fuel. On average fuel prices in 1996 were 20 per cent higher than in 1995 (Figure 1-3). This can be attributed to a relatively severe winter in the Northern Hemisphere during 1995/1996 which reduced stocks. This resulted in increased costs to the airlines which many airlines did not fully pass on to their customers. This had a noticeable effect on the overall operating profitability, though the net profitability improved due to lower non-operating costs.

Chapter 2
Air Carriers and their Fleets

2.1 This chapter reviews developments in 1996 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 1996 is also included.

ECONOMIC REGULATION

Air transport agreements and negotiations

2.2 Although the number of bilateral air service agreements, amendments and memoranda of understanding (MOUs) reported in 1996 was about ten per cent less than that in 1995, the total still exceeded that of 1994 by a substantial margin. Of the 90 agreements, amendments and MOUs in 1996, 31 were between States within the same ICAO region and 59 were between States in different regions, a somewhat higher ratio of between-region instruments than in the previous year. This could indicate that, in general, States within regions are using existing bilateral agreements and arrangements as well as new and existing regional arrangements, thereby shifting the focus of bilateral negotiations towards bilaterals between States in different regions.

2.3 Of the 45 new, first time bilateral agreements reported in 1996, 19 were between States within the same ICAO region (over half within the Asia/Pacific region) and 26 were between States in different regions. Agreements that replaced existing ones were heavily weighted toward the between-region category by a total of 18 to 4, as were amendments and MOUs with a 15 to 8 margin.

2.4 Of the 65 agreements, amendments and MOUs about which information was available, 5 accorded essentially full market access (where air carriers determined points to be served, capacity and tariffs between the territories of the bilateral partners); 28 provided improved market access in terms of additional designations or traffic rights; 12 increased capacity; 15 expanded both market access and capacity; and 5 extended existing arrangements with respect to traffic rights and capacity or added security clauses. The number of agreements and amendments that specifically dealt with codesharing in 1996 (15 of the 62 agreements and amendments) showed a marked increase over 1995, indicating that this area of international air transport is receiving increased attention by bilateral negotiators.

2.5 The combination of expanding air services and capacity-constrained airports made the availability of airport slots (times assigned for an aircraft to take off or land) for additional services an increasingly important issue with respect to both existing bilateral agreements and those being negotiated, among which was one under discussion between the United Kingdom and the United States. Several such airports are located in Europe, and the European Commission in April 1996 issued a discussion paper with several options to amend the Commission's code of conduct for the allocation of airport slots to ameliorate this situation.

2.6 Bilateral negotiations between the European Union and the United States moved forward after the European Union's Council of Ministers approved on 25 July 1996 a negotiating mandate for the European Commission (EC) which provided that bilateral agreements should be maintained and that progress should be achieved on such issues as competition rules, foreign ownership limits and computer reservation systems before negotiations on market access are undertaken. Officials from the EC and the United States held an exploratory meeting on 30 and 31 October, and again on 6 December. In the European area, the Council approved on 11 November a mandate for the Commission to negotiate with ten Eastern and Central European States on the terms of their participation in the single European market, with negotiations scheduled to begin in early 1997.

Regional regulatory developments

2.7 With the completion in April 1997 of the final phase of creating a single market for air services within the European Union, when restrictions on cabotage will be removed, the EC issued in October 1996 an assessment of the impact of the third package of air transport liberalization measures. The Commission's evaluation concluded that liberalization had happened in a progressive way without major upsets and that the Community had found a balance between competition and control mechanisms which benefited both consumers and competition. However, the Commission noted four areas where further work was needed: air fares that are excessively high or non-transparent; capacity restrictions resulting from congested airports and the manner in which air traffic control is managed; reduction of air transport costs in areas such as ground handling, airport fees and air traffic control costs; and better access to the market to ensure that competition is maintained, for example, with respect to dominant alliances, public service routes, and restructuring aid.

2.8 Two new regional arrangements on international air services came to fruition in 1996. In July, 14 Member States of the Caribbean Community (CARICOM) concluded a Multilateral Agreement Concerning the Operation of Air Services within the Community to provide for a more liberal and transparent exchange of commercial route rights within this area in the context of traffic requirements. In December, 6 States (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay) signed an agreement on subregional air services with the objective of allowing new scheduled air services on routes other than those already operated under bilateral agreements between States in the subregion. With the earlier subregional agreement on liberalizing air services between and among States in the Andean Pact (Bolivia, Colombia, Ecuador, Peru and Venezuela), this brings to 3 the number of such agreements in this region.

2.9 In the African region, States sought to meet major challenges such as implementation of the Yamoussoukro Declaration and the efficient and cost-effective operation of the African air space system within the framework of the implementation of the ICAO CNS/ATM system by changing the structure and working methods of the African Civil Aviation Commission as well as by reorganizing its resources. In Asia/Pacific, members of the Asia-Pacific Economic Cooperation (APEC) forum continued to explore ways of increasing competitive air services within the region, including policy options developed by the APEC transportation working group. The recently established Arab Civil Aviation Commission included the economic aspects of air transport amongst its priorities for future meetings.

State aid

2.10 During 1996 the EC authorized the payment of tranches of financial assistance packages to Air France, Iberia, and TAP Air Portugal. This was the last tranche for the French carrier, while the two other airlines were authorized to receive one more instalment after they had met certain conditions and demonstrated the successful implementation of their restructuring plans.

2.11 Six European airlines lodged complaints with the EC alleging that Air France had not met several conditions attached to the aid package, including usage of subsidies for "dumping" tickets at low prices, but failed to prevent approval of the final tranche. The French Government, however, blocked 20 per cent of it until the airline implements further restructuring measures (to be completed by March 1997) and other conditions are met. Air France and the French Government were also facing court action brought by another French carrier, TAT, which requested annulment of the EC decision to approve payment of a second tranche of aid, alleging Air France did not fulfil obligations originally imposed by the EC for further state aid payment.

2.12 In the case of Iberia, the EC demanded that Aerolineas Argentinas and the Chilean airline Ladeco be removed from its portfolio. The pilot's union of Aviaco (a subsidiary of Iberia) filed a complaint with the EC and Spanish competition authorities against the recapitalization of Iberia by the State, claiming it did not comply with the competition rules and had failed to abide by the conditions imposed by the EC.

2.13 The EC also asked the Greek Government to postpone the second of the three-approved cash injections for Olympic Airways on the grounds that the conditions which had been set, including the Government's role in the airline's management, had not been fulfilled. The EC also launched an investigation into the investment plan of the Italian Government to restructure Alitalia. On a complaint by British Airways franchise operator CityFlyer Express, the EC decided that the Flemish regional government cash aid to Belgian airline VLM was illegal.

2.14 Elsewhere in the world, the Indonesian Government took over the $745 million debt of Garuda Indonesia as part of an effort to prepare it for privatization. The French Government agreed to inject indirectly about $18 million into Air Afrique in the form of financial assistance to 11 African nations that hold stakes in that airline, in order to help the airline

absorb its 1995 losses and ease its debt. El Al asked the Israeli Government to resume its funding of El Al's security budget in full. Algeria decided not to provide more public funds for Air Algerie.

2.15 Governments differed on their policies in respect of subsidies to airlines that operate unprofitable domestic routes. France approved financial support to air services on 22 routes from a cross-subsidization fund formed by imposing a tax on domestic passengers. The Indian Government rejected a joint request from that country's private domestic airlines to eliminate the requirement to provide low-fare air services on loss-making routes, or to reimburse them for at least part of their losses, or to reduce the percentage of trunk-route service (which was established at 10 per cent) they must devote to those routes. The Islamic Republic of Iran stopped subsidizing domestic flights, eliminating the last low-budget fares on its flag carrier Iran Air.

Follow-up to the ICAO World-wide Air Transport Conference (1994)

2.16 The reactivated ICAO Air Transport Regulation Panel met for the first time in March 1996 and initiated its work on four specific tasks. After extensive discussions of possible safeguard mechanisms or alternatives thereto for fair competition in less regulated regimes and of various means for ensuring effective and sustained participation of all States in international air transport, the Panel set up a Working Group which was able to formulate more specific proposals by December, in advance of the Panel's next meeting. With respect to broadening the ownership and control criteria for the use of market access, the Panel agreed to five criteria to be used in judging means to achieve this. Agreeing with a conclusion of the 1994 Conference, the Panel saw no prospects in the near future of developing a more formal structure for "hard" rights on a multilateral basis.

2.17 Three of the tasks which the Council had assigned to the Secretariat were completed. Two studies, *Implications of Airline Codesharing* (Circ. 269) and *Preferential Measures for the Developing Countries in the Economic Regulation of International Air Transport* (State Letter EC 2/75-97/1), were completed and distributed to States. With the aid of a Study Group, the review of the ICAO Code of Conduct for the Regulation and Operation of Computer Reservation Systems (CRSs) was completed, and the Council on 25 June 1996 approved a revised ICAO CRS Code to replace in its entirety, effective 1 November 1996, the Code adopted in 1991 (see Product Distribution below for details). Work continued on an analytical model for determining the net national benefits of international air transport.

MARKET ENTRY AND EXIT

New and discontinued carriers

2.18 Excluding the Russian Federation and the Ukraine, during the year about 110 air carriers with at least one aircraft with a maximum take-off mass not less than 9 tonnes

(20 000 lbs) were reported to have started operations; a further 120 were constituted but, by the end of the year, had yet to commence operations. Some 70 air carriers went out of business including some that had never started operations.

2.19 During 1996, the majority of the new entrants were either small regional or domestic operators. Of the new entrants that started operations in 1996, air carriers based in North America (predominantly in the United States) and Europe accounted for more than a quarter each, and those in Asia/Pacific accounted for another 20 per cent, with the balance coming from air carriers based in Africa and Latin America.

2.20 Many start-ups were so-called low-cost, no-frills carriers, confirming a trend to world-wide spreading of these types of carriers from the original market, the United States. For example, such airlines started to operate in Belgium (City Bird, Virgin Express), Canada (Greyhound Air, WestJet Airlines), Italy (Noman), New Zealand (Value Airlines), and the United Kingdom (Debonair). Among such new entrants in the United States itself was a famous name, Pan American World Airways, which was reborn as a low-cost, domestic carrier. Well-established airlines also continued to set up separate, low-cost operations with different degrees of independence. Examples included Alliance Air (the subsidiary of Indian Airlines), Alitalia Team in Italy, and Delta Express in the United States, all of which started operations in 1996.

2.21 Among the air carriers that ceased operations in 1996 were many with just a few years or even months of operation. More than 40 per cent of the airlines that ceased to operate (outside the Russian Federation) were based in Europe, while North America and Latin America/Caribbean each accounted for about 20 per cent.

2.22 On the basis of schedules published in multilateral airline schedule guides, it is estimated that at the end of 1996 there were some 720 air carriers world-wide providing scheduled passenger services (international and/or domestic) and about 70 operating scheduled all-freight services. About 75 per cent of all air carriers operating scheduled air services were accounted for in three regions: North America, Europe and Asia/Pacific. International scheduled passenger services were provided by some 440 carriers, while about 50 carriers provided international scheduled all-freight services. Over 50 per cent of air carriers providing international scheduled services were accounted for in two regions: Europe and Latin America/Caribbean.

OWNERSHIP, ALLIANCES AND CO-OPERATION

Privatization

2.23 During 1996 the process of partial or full privatization of government-owned airlines continued. Two airlines achieved privatization aims, while privatization objectives or plans were made known for another ten airlines, among which five were from Africa. Furthermore, preparations for privatization continued during the year for some twenty government-owned carriers that had been targeted during the previous years (see Table 2-1).

Table 2-1. Partial or full privatization of government-owned airlines

Targeted during 1996	Targeted before 1996 and still under preparation	Aim achieved during 1996
Air Algerie	Aeroflot (Russian Federation)	Kenya Airways
Air Niugini	Air France	Aeropostal (Venezuela)
Air Senegal	Air India	
Air Zimbabwe	Air Lanka	
Armenian Airlines	Alitalia	
Domodedovo Airlines (Russia)	China Eastern Airlines	
Kazakhstan Airlines	China Southern Airlines	
Mozambique Airlines	El Al (Israel)	
Pakistan International Airlines	Estonian Air	
Sunair (South Africa)	Garuda Indonesia	
	Ghana Airways	
	Iberia	
	Kuwait Airways	
	LOT-Polish airlines	
	MALEV-Hungarian Airlines	
	Pacific East Asia Cargo (Philippines)	
	Royal Air Maroc	
	Sudan Airways	
	Saudi Arabian Airlines	
	South African Airways	
	Thai Airways International	

2.24 Among reported developments were the following: after selling a 26 per cent stake to its strategic partner KLM, Kenya Airways successfully floated another 48 per cent of its shares on the Nairobi stock exchange (14 per cent for international investors and 34 per cent for Kenyan individuals and institutions). Venezuelan state-owned airline Aeropostal, after two years of preparation, was finally privatized when the Government sold it to a multinational investment group.

2.25 In Europe, the German Government sold its remaining 36 per cent stake in Lufthansa, while the Government of the Kingdom of the Netherlands made an arrangement with KLM to further reduce its shareholding from 38.2 to 25 per cent. The Spanish Government developed a plan to reduce its stake in Iberia from 100 to 60 per cent over the next few years. The Hungarian Government planned to further reduce its shareholding in MALEV from 63.9 to 50.1 per cent.

2.26 In Asia, two Chinese carriers, China Eastern Airlines and China Southern Airlines, intensified preparations for the planned listing of their shares on foreign stock exchanges in early 1997. Garuda Indonesia, Thai Airways International and Philippine Airlines continued their restructuring in preparation for partial privatization, while the Sri Lanka Government's planned sale of a 40 per cent stake in Air Lanka to a strategic foreign partner drew bidding from some ninety interested investors. Elsewhere, the Mozambican Government invited

bidding from foreign and domestic private investors to purchase 51 per cent of its shares in the national carrier LAM (Mozambique Airlines), while the Government of Senegal planned to sell a 51 per cent stake of Air Senegal to private interests, including a 20 per cent stake to Air Afrique, its employees and local investors.

2.27 As in previous years, the privatization of several carriers (e.g. LOT-Polish Airlines and El Al of Israel) had to be deferred or postponed because of the complexities encountered in the process or the economic condition of the airlines concerned.

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

National consolidation

2.29 In 1996 two airline consolidations were reported at the national level. In Mexico, the Government approved the merger of the country's two largest airlines, Aeromexico and Mexicana. In the Middle East, Yemen's two national airlines, Yemen Airways (Yemenia) and Yemen Airlines (Alyemda), formally merged into one, with its corporate identity as Yemenia-Yemen Airways.

2.30 In China, encouraged by the Government's policy to rationalize the airline industry structure, China Northern Airlines absorbed Harbin-based regional Swan Airlines; China Northwest Airlines merged with Nanjing Airlines, while China National Aviation Corporation took control of Hangzhou-based Zhejian Airlines as its wholly owned subsidiary. Merger talks were also initiated between China Southwest Airlines and Guizhou Airlines. In Malaysia, the national carrier Malaysia Airlines took over regional carrier Pelangi Air. In India, Jet Airways acquired regional Gujarat Airways, but the merger plan for Air India and Indian Airlines was stalled.

2.31 In Europe, the Airlines of Britain Group, the parent company of British Midland Airways, acquired full control of Aberdeen-based Business Air, while Air France unveiled a plan to merge with its domestic sister company Air Inter Europe in 1997 to form a single entity Groupe Air France. Elsewhere, the Brazilian carrier TAM completed its acquisition of another regional carrier Helisul.

Transnational ownership

2.32 The trend towards partial foreign ownership of airlines continued during 1996. The Government of New Zealand amended rules to relax restrictions on foreign investment in its national carrier by raising the permitted foreign ownership level from 35 to 49 per cent.

2.33 Many airlines continued to make equity investment in foreign carriers, often as part of a strategy to forge or strengthen alliances and expand market access.

2.34 SAS increased its stake in Latvian airline Air Baltic from 16 to 29 per cent. British Airways (BA) took full control of private French airline TAT, which was already 49.9 per cent owned by BA, by buying the remaining 50.1 per cent stake; it also won approval to acquire a 67 per cent stake in another French carrier Air Liberté. Martinair of the Kingdom of the Netherlands took a 40 per cent shareholding in Colombian airline Tampa. Swissair and Austrian Airlines jointly purchased an 18.37 per cent stake in Ukraine International Airlines through a holding company set up for that purpose. Virgin Atlantic acquired a 90 per cent stake in the Belgian carrier EuroBelgian Airlines, to be operated under the name Virgin Express.

2.35 Elsewhere, Air New Zealand won government approval for acquisition of a 50 per cent stake in Ansett Australia, which would continue to operate under its distinctive identity. Japan Air System bought a 10 per cent stake in Manila-based Air Philippines. Mesa Air Group of the United States took a 44 per cent equity interest in Community Express Airlines, a regional carrier based in Birmingham, United Kingdom, while a Geneva-based American company, New England International, took a 67 per cent stake in Congo's airline Lina Congo. Brazilian regional TAM purchased control of the Paraguayan airline LAPSA from the latter's previous owner Saeta.

2.36 During the year, ECO Air, a joint venture airline formed by ten member countries of the Economic Co-operation Organization (ECO) in Central Asia, was finally launched. The Indian Government gave final approval for Lufthansa Cargo India, a joint venture cargo airline formed by the Hindujas Group (60 per cent) and Lufthansa Cargo AG of Germany (40 per cent), to begin operations in the country, but the launch of another proposed joint venture airline between Tata Industries (60 per cent) and Singapore Airlines (40 per cent) remained under review.

2.37 Finally, several carriers reduced their interest in their foreign partners. Air Canada reduced its stake in Continental Airlines of the United States from 19.6 to 10 per cent. As part of its restructuring strategy, Spanish national carrier Iberia sold a 30 per cent stake in its Latin American partner airline Aerolineas Argentinas and planned to sell 25 per cent of its shareholding in the Chilean carrier Ladeco. British Airways also planned to sell its 25 per cent stake in USAir (subsequently renamed US Airways).

Transnational alliances

2.38 Throughout 1996, airlines continued to express great interest in forging alliances. Those where codesharing and its associated forms of blocked space, joint/pool services and franchising were explicitly mentioned comprised about 80 per cent of the agreements signed; other elements of collaborative ventures included marketing and frequent flyer programmes, interlining and, more rarely, joint maintenance. Of the 206 co-operative agreements (almost twice as many as the number recorded in 1995), involving 153 different airlines (a 78 per cent increase over 1995), signed during 1996, 37 per cent were on an intraregional basis and 63 per cent were interregional. The Americas and Europe were the most active areas in both intraregional and interregional agreements (accounting for 43 per cent of the latter).

2.39 Important new wide-ranging alliances or significant changes included a partnership amongst Air Canada/Lufthansa/SAS/South African/Thai/United. Delta Air Lines (United States), which already has an extensive range of codeshare alliances, continued its strategy of signing new or extending specific accords with various airlines, including Air France. Continental Airlines also signed a co-operative agreement with Air France. Other airlines of the United States were very active in 1996; among them were American Airlines, signing 17 new or extended agreements with carriers in all regions of the world (including a possible far-reaching alliance with British Airways), Carnival Airlines and the newly revived Pan American, which also concluded a number of interlining or codesharing agreements with airlines in all parts of the world. A number of agreements took place between North American and Asian airlines: American Airlines with Philippine Airlines, Singapore Airlines and China Airlines; Northwest Airlines with Garuda Indonesia and Air China; All Nippon Airways signed with Air Canada and Delta Air Lines, which itself signed with Korean Air; and Air India concluded agreements with both Continental Airlines and United Airlines.

2.40 In the Pacific area, the most active carrier in securing collaborative agreements was Air New Zealand which signed eight such agreements, including a strategic alliance with United Airlines. Considerable activity also took place in Latin America, where carriers secured agreements between themselves and also with North American carriers (notably American Airlines and Continental Airlines), while at the same time considering new types of relations with European carriers (notably Iberia). On a more limited scale, the European carrier British Midland Airways continued its strategy of signing feeder-type agreements with various new airlines in different parts of the world. Little agreement-signing activity was recorded in the Middle East, and the African continent continued to remain outside this trend, with the notable exception of South African Airways and other local carriers of the same country, which signed several agreements with airlines in different parts of the world.

2.41 Few agreements were terminated during the year. Notable among them were the British Airways/USAir agreement, and some agreements involving Air Canada and the German carrier Lufthansa where their strategy had to be modified to align it with their other alliance partners.

2.42 The regulatory implications of alliances continued to attract much attention from regulatory authorities. One study on airline codesharing was published during the year by the European Commission, in which a ban on intraregional codesharing was suggested. A recommendation was adopted in June 1996 by the Directors General of Civil Aviation of the member countries of the European Civil Aviation Conference to take care of the consumer information and protection issues of codesharing, and a rule-making procedure was still under way in the United States aimed at better protecting consumers. In Australia, a Code of Conduct was agreed between the Government, the two major domestic airlines and the Federation of Travel Agents for better information on a codeshared operation for consumers. ICAO completed a study on the general implications of codesharing in its different aspects.

2.43 Following the announcement of the proposed alliance between British Airways and American Airlines, the European Commission, concerned by the possible effects of this grouping on competition (notably on North Atlantic routes), launched an investigation of this and other already existing alliances. In the United States, the Department of Transportation

approved some new alliances or renewed authority for existing agreements, often approving expansion of some of them. Three major alliances (United/Lufthansa/SAS, American/Canadian and the "Atlantic Excellence Airlines" grouping made up of Delta/Austrian/Sabena/Swissair) received antitrust immunity from U.S. regulatory authorities, with certain restrictions imposed.

SERVICE LEVELS

2.44 During 1996, recovery of the premium travel market continued and many major airlines embarked on revamping their premium class services. In first class, more airlines implemented the personalized cabin area concept, installing in some cases fully horizontal sleeper seats (for example, All Nippon Airways and Sabena). The sleeping compartment, an option for 10 bunk beds in three separate cabins in the front cargo hold of the Airbus A340-300 introduced by the manufacturer in 1995, found its first customer, Virgin Atlantic Airways, which was planning to offer this service in the second half of 1997.

2.45 A number of air carriers adjusted the level of service by eliminating first class. For example, Air India and Gulf Air removed first-class service from flights between their countries, and Japan Airlines dropped it on transpacific routes. Ansett Australia and Carnival Airlines of the United States replaced first class on their domestic services by business class.

2.46 At the same time, in the United States domestic market, the list of major airlines reacting to the upturn in demand for first-class service expanded in 1996 with US Airways replacing its Business Select on 31 Boeing 737-200s with first class and with Northwest Airlines expanding or adding (where it was only an all-economy layout) first class on its 35 DC-9-50s. Strong demand for British Airways new first-class sleeper seats between London and New York also prompted that airline to add more sleeper seats on that route.

2.47 Airlines' attempts to add new amenities, with particular emphasis on business class, were much the same as during previous years. This included, among other things, wider seats with greater leg room, improved entertainment, higher-quality food, and better lounge facilities at airports which, in many cases, were being developed into business centres with computers and communication equipment and with such luxuries as hydrotherapy baths, massages, etc. Airlines also continued to extend services and conveniences to economy-class passengers. Many airlines, particularly European ones, continued to introduce convertible seats to respond better to the fluctuations between demand for business and economy class travel.

2.48 Aircraft cabin air quality continued to be a subject of discussion. In the United States, legislation was introduced to regulate the recirculation of air in the passenger cabins including monitoring humidity and ozone levels. New technologies to control humidity and oxygen concentration were developed. After one system to provide passengers and crew with comfortable levels of humidity was flight proven, several airlines signed up for installation of this equipment on their Boeing 747s, 767s and Airbus A340 aircraft.

2.49 Airlines continued to consider sophisticated entertainment systems an important competitive tool. The World Airline Entertainment Association (WAEA) estimated that in 1996 airlines' expenditures for in-flight entertainment (IFE) and communications reached $1.2 billion, up from the reported $400 million in 1992. Hardware accounted for half of that amount and satellite telecommunication and in-flight telephony represented another quarter. The second generation of interactive IFE systems (IIFE) of varying ranges of capability, with increased reliability and simplified handling, was on offer to airlines from at least half-a-dozen suppliers.

2.50 In-flight gambling, a potential new source of airline revenue, moved closer to becoming a reality with British Airways and Singapore Airlines commencing in-service trials, and with Swissair also installing equipment. At the same time, two major international carriers, one from Asia and another from Europe, rejected in-flight gambling citing its incompatibility with their image. The United States Department of Transportation (DOT) released the results of a study on the likely impact of in-flight gambling. While discounting safety concerns and estimating net revenues of about $225 million annually for the United States carriers from their introduction of gambling on international flights, DOT recommended a continuation of the ban on the installation, transportation or operation of any gambling device on board United States or foreign aircraft operating commercial flights into and out of the country. A group of 13 European and Asia/Pacific airlines backed by some United States carriers (founded by ten carriers in 1995 as the International Airline Coalition on the Rule of Law) tried to persuade the United States authorities to accept in-flight gambling. The coalition emphasized its objection to the application of United States law outside U.S. territory.

2.51 Frequent flyer programmes continued to grow in their complexity through airlines' marketing alliances with thousands of companies, most of them not related to air travel. More carriers in the United States embarked on selling miles in certificates to businesses and corporations that use them as incentives or rewards to employees or clients. The spread of new programmes shifted predominantly to the level of regional or smaller international carriers, mostly linked to major international airlines.

FARES AND RATES

Tariff establishment

2.52 In 1996, the IATA multilateral tariff negotiation process continued to function against the background of uncertainty arising from governments' regulatory requirements, particularly the implications of competition laws, for their tariff co-ordination activities. In July, the European Commission issued a regulation to amend the block exemption which would prohibit the carriers of the European Union Member States from continuing to participate in IATA cargo tariff consultation on intra-EU routes as from 1 July 1997. The existing block exemption, granted in 1993, allowed EU airlines to participate in both passenger and cargo tariff consultation provided that they were aimed at facilitating

interlining. In order to address this situation, IATA initiated work on developing possible solutions that would meet the Commission's requirement and allow an individual exemption for such tariff consultation.

2.53 Separately, the United States Department of Transportation (DOT), in connection with its review of requests for antitrust immunity to be granted for commercial alliances between U.S.-based carriers and other foreign carriers, also addressed the question of continued participation in IATA tariff co-ordination. In its grant of the requested immunity to several alliance arrangements, the DOT imposed certain conditions, including a requirement that the airlines concerned withdraw from participation in any IATA tariff co-ordination activities that discuss through fares and rates applicable on routes between the United States and the alliance partner countries. As a result, IATA had to make certain adjustments in its tariff co-ordination process and meeting structure.

2.54 During the year there were no major changes in the IATA fares and rates level and structure, although some adjustments were agreed in certain markets to address local requirements. However, at a special meeting convened by IATA in November to address significant increases in the cost of aviation fuel, an agreement was reached to increase, subject to government approval, the industry-agreed passenger fare levels by 3 per cent worldwide with some minor variations on certain routes.

PRODUCT DISTRIBUTION

2.55 In 1996, airlines intensified efforts to reduce their distribution costs, focusing on such innovations as electronic ticketing, direct sales of discount tickets via the Internet, and lower commission costs.

2.56 Electronic ticketing, having completed trials and introduction in several major domestic markets, received a boost internationally when, in October, IATA adopted standards for issuing electronic tickets for on-line or interline carriage (except for codeshare arrangements which are handled bilaterally by the airlines concerned), including an itinerary/receipt document which contains information required to be furnished to the passenger. By year's end, a few airlines had begun to issue electronic tickets for international travel, and several others were planning to introduce the practice in 1997. CRS vendors began to provide electronic ticketing for carriers and on routes where it was available.

2.57 Public acceptance of electronic ticketing varied; one survey found it generally more acceptable in the United States than Europe, although satisfaction was highest with a smart-card type of system in which the passenger used a plastic card issued by the airline, rather than relying solely on a confirmation number, to secure boarding passes. Some corporate clients were concerned about the need for expense records for tax purposes. There were also questions of how electronically ticketed passengers could pass security checkpoints in airport concourses restricted to ticketed passengers.

2.58 In the United States where electronic ticketing is becoming widely available for domestic flights, the U.S. Department of Transportation in January 1996 issued a request for comments, seeking views on how best to provide passengers using electronic tickets with required notices on such matters as oversales, domestic and international baggage liability, contract of carriage terms, terms of electronic tariff (international), refund penalties, international fare increases and death/injury liability limits.

2.59 Sales and marketing of air transportation via the Internet increased as airlines and travel agents explored the possibilities of direct links to a rapidly growing group of potential customers. Some airlines began applying yield management techniques to bookings and sales of passenger tickets through the Internet by auctioning a fixed number of seats or offering restricted discount tickets on certain flights and routes where bookings were weak. Larger travel agencies used Internet sites for promotion purposes and to facilitate bookings and ticketing for their clients.

2.60 Airlines continued efforts to reduce commission costs, for example, by setting lower rates for sales via the Internet and for sales using electronic ticketing, in addition to direct negotiations with travel agents and efforts to limit over-rides (extra commissions) in certain countries. In the United States, the legal proceeding in which travel agents alleged that airlines which had limited the commission on domestic ticket sales had violated anti-trust laws was settled without trial as a result of an offer of $86 million by the airlines concerned, subject to court approval of the method to be used in dividing the money among affected travel agents. A survey of commission rates in the United States in mid-1996 indicated a drop of about 10 per cent in commission costs in 1995 (from 10.7 to 9 per cent of passenger revenue) and a further decline in the first six months of 1996 (to 8.5 per cent of passenger revenue) which was attributed to a combination of the domestic commission limit and electronic ticketing.

2.61 In the computer reservation systems area, on 25 June 1996, the ICAO Council adopted a revised and updated CRS Code of Conduct to take effect on 1 November 1996 and to replace in its entirety the one adopted by the Council in 1991. The principal changes in the new ICAO Code include expanding its applicability to non-scheduled air services and to information systems such as the Internet (where States find this necessary), strengthening safeguards or the privacy of personal data, requiring that passengers be informed of codeshared and non-scheduled flights, establishing additional criteria for CRS fees, adopting more specific criteria for the order of flight displays, limiting the number of times codeshared flights can be displayed, prohibiting fictitious bookings, and permitting developing countries to exclude foreign CRS vendors until 31 December 2000.

2.62 The revised ICAO CRS Code takes into account current market practices and the critical need for harmonization of the various national and regional CRS regulations and is compatible with the General Agreement on Trade in Services (which was concluded after the first ICAO CRS Code was adopted in 1991) whose Annex on Air Transport includes computer reservation systems. In urging States to follow the ICAO CRS Code, the Council also provided model clauses for use at their discretion in bilateral and multilateral agreements and arrangements on air services as a means of strengthening and complementing the Code of Conduct.

2.63 The European Commission, in two meetings with interested parties, considered several proposed changes to its own CRS Code, such as a code of reservation ethics for subscribers, possible inclusion of rail and information services, removing the distinction between direct flights with one or more stops and indirect flights in the flight display order, and limiting the charge for the provision of billing information to shipping and the cost of the medium used. The Commission also drafted a Charging Principles Guidance Note, intended to clarify some of the issues involved in the area of CRS pricing, including incentives for travel agents, passive and duplicate bookings, unfeasible segments, cancellations and higher functionality charges.

2.64 The U.S. Department of Transportation, in addition to continuing a general review of its CRS regulations, issued two proposed rules concerning, respectively, allowing certain airlines to vary the level of their participation in CRSs and eliminating built-in bias for on-line services.

2.65 In April 1996, Australia amended its CRS code of conduct to require system vendors to offer CRS access to subscriber groups using a communications system different from that of the system vendor and to include more detailed conciliation procedures for dispute settlement.

TRAFFIC

2.66 Indicators are given below of the development of airline scheduled traffic in 1996, 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

2.67 The total scheduled traffic (domestic plus international) carried by the airlines of the 185 Contracting States of ICAO in 1996 is estimated at about 315 billion tonne-kilometres performed, an increase of about 7 per cent over 1995. The airlines carried a total of about 1 380 million passengers in 1996, compared with 1 302 million passengers in 1995, and about 23 million tonnes of freight compared with some 22 million tonnes in 1995 (Table 2-2). The passenger load factor increased by one percentage point to 68 per cent, while the over-all (weight) load factor remained at 60 per cent.

2.68 International scheduled traffic continued to show strong growth during 1996, with increases of about 8 per cent in tonne-kilometres performed, 9 per cent in passengers carried, and some 5 per cent in freight tonnes carried. International traffic accounted for some 57 per cent of total passenger-kilometres performed, 85 per cent of the freight tonne-kilometres performed and some 65 per cent of the total tonne-kilometres performed.

2.69 During 1996, domestic traffic showed more modest growth, increasing some 5 per cent from about 104 billion tonne-kilometres performed in 1995 to almost 110 billion tonne-kilometres performed in 1996.

Table 2-2. 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)								
1995	1 302	2 251 170	67	21.8	83 120	5 640	293 920	60
1996	1 380	2 411 010	68	23.0	88 810	5 890	314 680	60
Percentage change	6.0	7.1	1.0	5.5	6.8	4.4	7.1	0.0
INTERNATIONAL								
1995	375	1 252 870	68	13.0	70 320	2 400	189 480	63
1996	409	1 363 350	69	13.7	75 200	2 550	204 870	63
Percentage change	9.1	8.8	1.0	5.4	6.9	6.3	8.1	0.0
DOMESTIC								
1995	927	998 300	65	8.8	12 800	3 240	104 440	55
1996	971	1 047 660	67	9.3	13 610	3 340	109 810	55
Percentage change	4.7	4.9	2.0	5.7	6.3	3.1	5.1	0.0

Source: ICAO Air Transport Reporting Form A-1.

Scheduled: regional breakdown

2.70 Between 1995 and 1996, 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 some 5 per cent for the airlines registered in Europe to 9 per cent for those registered in Africa (Table 2-3). International scheduled services also posted increases in passenger-kilometres performed for all regions, ranging from about 7 per cent for airlines registered in the Middle East to some 11 per cent for those registered in Latin America and the Caribbean. In 1996 double digit percentage increases in total and international freight tonne-kilometres performed were recorded only for carriers registered in North America.

2.71 The differences in regional traffic development between 1995 and 1996 caused some small changes in the distribution of this traffic. The regional distribution for total and for international scheduled traffic in 1996 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 1996, the airlines of North America carried about 37 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.

2.72 In 1996, airlines registered in Europe showed the highest average annual weight load factor on international scheduled services (about 66 per cent), while those in Africa showed the lowest average load factor (some 50 per cent). Compared with 1995, the weight load factors for international scheduled services (shown in Table A1-1 in Appendix 1) represent an increase of about one percentage point for the airlines of Latin America and the

Table 2-3. Growth of scheduled traffic by region of airline registration: 1995-1996
(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	6.0	9.1	5.6	6.5	7.9
Asia and Pacific	5.7	8.3	7.7	7.0	8.5
Europe	4.0	4.8	3.9	2.9	4.8
Middle East	7.8	7.6	5.5	4.3	5.2
North America	7.3	7.7	10.3	4.6	8.0
Latin America and Caribbean	3.8	6.4	2.3	0.0	5.8
Total	6.0	7.1	6.8	4.4	7.1
INTERNATIONAL					
Africa	7.0	9.3	5.3	3.7	8.4
Asia and Pacific	9.9	9.9	7.7	7.3	9.1
Europe	7.8	8.4	4.1	4.3	6.9
Middle East	5.0	6.8	5.4	4.7	4.5
North America	9.5	7.9	12.2	7.2	9.3
Latin America and Caribbean	15.7	11.0	4.5	3.2	8.9
Total	9.1	8.8	6.9	6.3	8.1

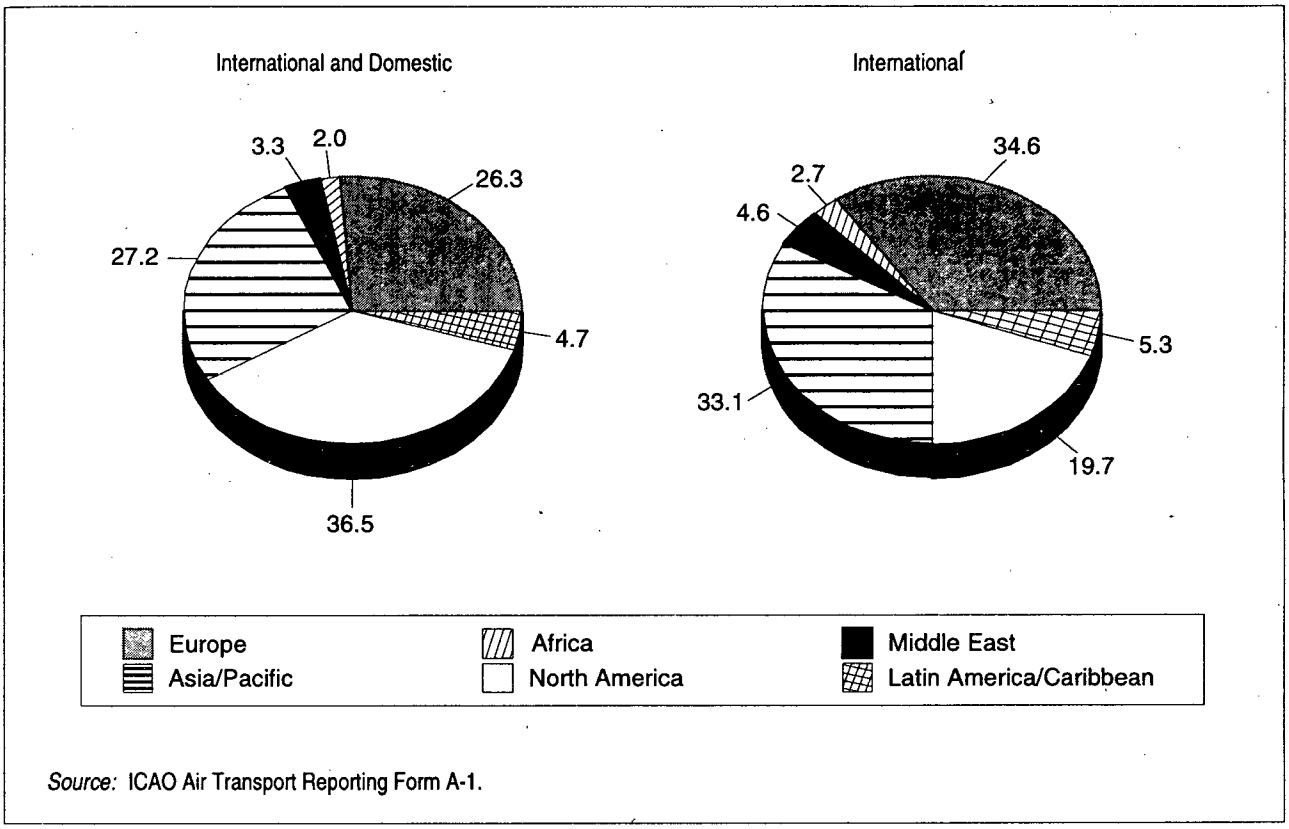
Source: ICAO Air Transport Reporting Form A-1.

Caribbean, and a decrease of about one percentage point for those of Africa and Europe, while there was no change in the average weight load factor for the airlines of Asia/Pacific, the Middle East and North America.

Scheduled: carrier rankings

2.73 Table 2-4 shows the top 30 air carriers in the world in 1996 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 1995 and in 1987. Table 2-5 shows the top 30 air carrier rankings according to the same parameters but in terms of international scheduled traffic.

2.74 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



Source: ICAO Air Transport Reporting Form A-1.

Figure 2-1. Percentage distribution of scheduled traffic in 1996 according to region of registration of airline — total tonne-kilometres performed

are particularly striking. In 1987 Pan American, ranked 3rd (after British Airways and JAL) in the world in terms of passenger-kilometres performed and 5th in terms of total traffic carried, and TWA which ranked 10th and 12th respectively in 1987 moved to 30th and 37th in 1996. On the other hand, United which ranked 11th (passenger-kilometres) and 16th (total) in 1987, rose to 2nd and 6th respectively by 1996, American moved from 17th to 5th in terms of passenger-kilometres and from 21th to 10th in total, and Delta moved from 29th to 13th (passenger-kilometres) and from 37th to 13th (total) over the same period.

Scheduled: country rankings

2.75 Rankings for the top 30 countries or groups of countries by volume of scheduled traffic generated by their airlines in 1996, 1995 and 1987 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 2-6 and 2-7. In 1996, approximately 43 per cent of the total volume of scheduled passenger,

Table 2-4. Top 30 scheduled air carriers in 1996 and their ranking in 1995 and 1987 in terms of TOTAL (international and domestic) scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987	Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987	Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987
United	187 536	1	1	2	Federal Express	7 894	1	1	11	United	20 502	1	1	2
American	168 174	2	2	3	Lufthansa	6 187	2	2	2	American	18 254	2	2	3
Delta	151 048	3	3	4	Korean Air	5 236	3	3	9	Delta	15 769	3	3	6
Northwest	110 420	4	4	5	Air France	4 812	4	4	5	Northwest	13 254	4	4	4
British Airways	96 700	5	5	9	SIA	4 211	5	7	12	British Airways	13 113	5	5	11
JAL	75 837	6	6	10	JAL	4 069	6	5	4	Lufthansa	12 520	6	6	8
Lufthansa	63 255	7	7	12	KLM	3 926	7	6	7	JAL	10 846	7	7	5
USAir	62 659	8	8	19	United	3 485	8	8	8	Air France	10 747	8	8	9
Continental	60 087	9	9	6	British Airways	3 427	9	10	10	SIA	9 296	9	9	15
Air France	57 480	10	11	13	Cathay Pacific	3 245	10	12	14	Korean Air	8 928	10	11	18
Qantas	55 594	11	10	16	Northwest	3 235	11	9	6	KLM	8 538	11	10	14
SIA	53 647	12	12	14	American	2 994	12	11	18	Federal Express	7 894	12	12	32
KLM	49 050	13	13	17	Delta	2 063	13	13	19	Cathay Pacific	7 050	13	14	20
All Nippon Airways	47 016	14	14	15	Qantas	1 751	14	14	17	Qantas	6 924	14	13	17
TWA	43 621	15	15	8	Nippon Cargo	1 653	15	15	24	Continental	6 178	15	16	7
Southwest	43 581	16	16	31	Swissair	1 561	16	16	21	USAir	6 106	16	15	25
Korean Air	41 643	17	17	25	Alitalia	1 493	17	17	15	All Nippon Airways	4 951	17	17	23
Cathay Pacific	39 945	18	18	22	Malaysia Airlines	1 418	18	20	36	Alitalia	4 914	18	18	21
Alitalia	34 556	19	19	24	Thai Airways	1 387	19	18	30	TWA	4 607	19	19	12
Air Canada	31 074	20	21	18	Asiana[2]	1 376	20	21	—	Southwest	4 085	20	21	43
Thai Airways	29 801	21	20	29	Varig	1 274	21	19	20	Thai Airways	4 075	21	20	29
Malaysia Airlines	26 862	22	23	43	Air Canada	1 140	22	25	23	Air Canada	3 959	22	23	19
Iberia	25 806	23	22	20	All Nippon Airways	1 136	23	24	35	Swissair	3 653	23	22	24
Canadian	24 944	24	24	27	Polar Air Cargo[3]	1 123	24	22	—	Malaysia Airlines	3 620	24	25	40
America West	24 579	25	25	35	El Al	1 118	25	23	25	Varig	3 297	25	24	26
Varig	21 787	26	26	30	United Parcel Service[2]	1 064	26	26	—	Iberia	3 082	26	26	22
Swissair	21 296	27	27	26	Saudia	884	27	27	31	Canadian	3 002	27	27	31
Air New Zealand	20 795	28	31	34	Iberia	760	28	30	27	Asiana[2]	2 621	28	30	—
SAS	19 448	29	28	28	Air China[4]	760	29	29	—	Saudia	2 592	29	28	27
Saudia	18 980	30	29	23	Canadian	739	30	28	40	Air New Zealand	2 554	30	32	36

1. Most 1996 data are computer-generated estimates; thus the ranking may change when final data become available.
2. Started operations in 1988.
3. Started operations in 1994.
4. No data for individual air carriers were reported by China prior to 1993.

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

Table 2-5. Top 30 scheduled air carriers in 1996 and their ranking in 1995 and 1987 in terms of INTERNATIONAL scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987	Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987	Carrier	Estimated 1996 (millions)	Ranking 1996	1995	1987
British Airways	94 194	1	1	1	Lufthansa	6 118	1	1	1	British Airways	12 886	1	1	3
United	72 573	2	2	11	Korean Air	5 133	2	2	6	Lufthansa	11 948	2	2	2
JAL	60 323	3	4	2	Air France	4 714	3	3	3	Air France	9 753	3	3	4
Lufthansa	58 114	4	3	4	SIA	4 211	4	5	8	JAL	9 346	4	4	1
American	54 810	5	5	17	KLM	3 926	5	4	5	SIA	9 296	5	5	7
SIA	53 647	6	6	5	JAL	3 735	6	6	2	United	8 751	6	6	16
Northwest	49 881	7	8	7	British Airways	3 423	7	7	7	KLM	8 538	7	7	6
KLM	49 043	8	7	9	Cathay Pacific	3 245	8	8	10	Korean Air	8 372	8	8	10
Air France	48 824	9	9	6	Federal Express	2 907	9	9	48	Cathay Pacific	7 050	9	10	11
Qantas	41 834	10	10	8	United	2 165	10	10	23	American	6 805	10	9	21
Cathay Pacific	39 945	11	12	12	Northwest	1 981	11	11	9	Northwest	6 507	11	11	8
Korean Air	35 992	12	13	18	American	1 832	12	12	35	Qantas	5 448	12	12	9
Delta	35 959	13	11	29	Nippon Cargo	1 653	13	13	15	Delta	4 308	13	13	37
Alitalia	28 027	14	14	14	Qantas	1 589	14	14	11	Alitalia	4 238	14	14	14
Thai Airways	26 498	15	15	19	Swissair	1 556	15	15	14	Thai Airways	3 744	15	15	18
Malaysia Airlines	22 377	16	16	34	Alitalia	1 463	16	16	13	Swissair	3 632	16	16	15
Swissair	21 128	17	17	15	Malaysia Airlines	1 360	17	18	30	Malaysia Airlines	3 199	17	17	35
Air Canada	20 295	18	19	20	Thai Airways	1 353	18	17	20	Federal Express	2 907	18	18	79
Iberia	20 150	19	18	13	Asiana[2]	1 347	19	19	—	Air Canada	2 749	19	21	20
Air New Zealand	19 150	20	20	25	El Al	1 118	20	21	16	Iberia	2 484	20	20	17
Canadian	16 469	21	21	27	United Parcel Service[2]	1 064	21	22	—	Air New Zealand	2 419	21	24	30
Virgin Atlantic	15 711	22	25	55	Delta	1 045	22	20	46	Varig	2 413	22	19	22
SAS	15 371	23	23	22	Varig	972	23	23	17	Asiana[2]	2 397	23	25	—
All Nippon Airways	15 254	24	28	48	Air Canada	908	24	25	21	El Al	2 154	24	22	25
Varig	14 907	25	24	28	Saudia	810	25	24	27	All Nippon Airways	2 139	25	28	50
Garuda	14 385	26	22	32	Polar Air Cargo[3]	729	26	27	—	Canadian	2 090	26	26	32
Saudia	13 126	27	27	21	Air New Zealand	720	27	32	31	SAS	2 008	27	29	24
Aeroflot (Aria)	13 031	28	26	16	All Nippon Airways	707	28	30	60	Saudia	1 991	28	23	23
PAL	12 848	29	29	30	Air China[4]	679	29	26	—	Virgin Atlantic	1 974	29	30	58
TWA	12 694	30	30	10	Iberia	670	30	28	22	Garuda	1 962	30	27	34

1. Most 1996 data are computer-generated estimates; thus the ranking may change when final data become available.
2. Started operations in 1988.
3. Started operations in 1994.
4. No data for individual air carriers were reported by China prior to 1993.

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

Table 2-6. Top 30 countries or groups of countries in 1996 and their ranking in 1995 and 1987 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 1996 (millions)	Ranking 1996	1995	1987	Country or group of countries	Estimated 1996 (millions)	Ranking 1996	1995	1987	Country or group of countries	Estimated 1996 (millions)	Ranking 1996	1995	1987
United States	921 481	1	1	1	United States	25 092	1	1	1	United States	108 670	1	1	1
United Kingdom	167 493	2	2	3	United Kingdom	7 959	2	2	6	United Kingdom	24 105	2	2	4
Japan	141 634	3	3	4	Japan	7 203	3	3	2	Japan	19 242	3	3	3
France	78 383	4	4	5	Republic of Korea	6 475	4	5	8	France	12 847	4	5	5
China[2]	70 605	5	7	14	Germany	6 189	5	4	4	Germany	12 770	5	4	6
Australia	69 930	6	5	7	France	4 977	6	6	3	Republic of Korea	11 300	6	6	12
Germany	65 943	7	6	8	Singapore	4 216	7	8	9	Netherlands	9 972	7	7	9
Netherlands	62 610	8	9	11	Netherlands	4 043	8	7	7	Singapore	9 349	8	8	10
Canada	56 018	9	10	6	China[2]	1 916	9	12	17	Australia	8 310	9	9	8
Republic of Korea	54 520	10	11	19	Canada	1 880	10	10	10	China[2]	7 649	10	10	17
Singapore	53 806	11	12	9	Australia	1 841	11	9	11	Canada	6 961	11	12	7
Russian Federation	52 710	12	8	—	Brazil	1 758	12	11	12	Russian Federation	5 643	12	11	—
Brazil	37 339	13	13	10	Switzerland	1 569	13	13	14	Brazil	5 182	13	13	11
Italy	36 123	14	14	13	Italy	1 552	14	14	13	Italy	4 803	14	14	13
Spain	33 205	15	15	12	Malaysia	1 432	15	16	24	Thailand	4 075	15	15	20
Thailand	29 801	16	16	21	Thailand	1 384	16	15	20	Switzerland	3 744	16	16	16
Malaysia	27 085	17	18	28	Israel	1 120	17	17	16	Spain	3 722	17	17	14
Indonesia	24 820	18	17	22	Gulf States[4]	1 010	18	18	36	Malaysia	3 680	18	18	27
Scandinavia[3]	23 118	19	20	17	Russian Federation	990	19	19	—	Indonesia	2 899	19	19	22
Switzerland	22 198	20	21	20	Saudi Arabia	889	20	20	21	Gulf States[4]	2 898	20	20	33
India	21 365	21	19	16	Chile	809	21	22	34	Scandinavia[3]	2 719	21	23	18
Gulf States[4]	20 041	22	23	32	Spain	767	22	23	18	Saudi Arabia	2 630	22	22	19
Saudi Arabia	19 342	23	24	18	Indonesia	730	23	21	25	India	2 472	23	21	15
Mexico	19 297	24	22	15	Scandinavia[3]	655	24	27	22	New Zealand	2 309	24	24	24
New Zealand	18 798	25	25	23	New Zealand	617	25	26	26	Israel	2 169	25	25	23
South Africa	15 538	26	26	26	India	579	26	24	15	Philippines	1 866	26	27	25
Philippines	15 006	27	27	24	Colombia	510	27	28	23	Mexico	1 805	27	26	21
Argentina	12 905	28	28	25	Belgium	480	28	25	19	South Africa	1 651	28	28	29
Israel	11 660	29	29	29	Pakistan	447	29	29	27	Argentina	1 448	29	32	30
Turkey	10 862	30	31	43	Philippines	394	30	30	30	Pakistan	1 425	30	29	28

1. Most 1996 data are computer-generated estimates; thus the ranking may change when final data become available.
2. Not including the Taiwan Province.
3. Three States, Denmark, Norway and Sweden, are partners in the consortium airline "Scandinavian Airlines System".
4. 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 and IATA.

Table 2-7. Top 30 countries or groups of countries in 1996 and their ranking in 1995 and 1987 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	Estimated 1996 (millions)	Ranking 1996	1995	1987	Country or group of countries	Estimated 1996 (millions)	Ranking 1996	1995	1987	Country or group of countries	Estimated 1996 (millions)	Ranking 1996	1995	1987
United States	255 912	1	1	1	United States	13 016	1	1	1	United States	36 227	1	1	1
United Kingdom	161 382	2	2	2	United Kingdom	7 925	2	2	5	United Kingdom	23 563	2	2	2
Japan	79 081	3	3	3	Republic of Korea	6 348	3	5	7	Japan	13 699	3	3	3
Netherlands	62 286	4	5	8	Japan	6 234	4	3	2	Germany	12 150	4	4	4
Germany	60 288	5	4	5	Germany	6 121	5	4	3	Republic of Korea	10 572	5	5	9
Singapore	53 806	6	6	6	France	4 744	6	6	4	France	10 071	6	7	5
France	52 021	7	7	4	Singapore	4 216	7	8	8	Netherlands	9 950	7	6	6
Republic of Korea	46 933	8	9	14	Netherlands	4 052	8	7	6	Singapore	9 349	8	8	7
Australia	42 957	9	8	7	Australia	1 624	9	9	9	Australia	5 589	9	9	8
Canada	36 764	10	10	9	Switzerland	1 560	10	10	12	Canada	4 838	10	10	10
Italy	28 346	11	11	12	Italy	1 519	11	11	10	Italy	4 070	11	11	11
Thailand	26 498	12	12	15	Canada	1 504	12	12	11	Thailand	3 744	12	13	14
Brazil	22 633	13	13	20	Malaysia	1 379	13	14	24	Switzerland	3 697	13	12	12
Malaysia	22 580	14	15	25	Thailand	1 351	14	13	17	Brazil	3 409	14	14	16
Switzerland	21 785	15	14	11	Brazil	1 234	15	15	14	Malaysia	3 251	15	15	26
Spain	21 649	16	16	10	Israel	1 118	16	16	13	Gulf States[4]	2 886	16	16	28
Gulf States[4]	19 902	17	17	29	Gulf States[4]	1 009	17	17	34	Spain	2 617	17	17	13
Russian Federation	18 715	18	18	—	China[2]	977	18	18	22	China[2]	2 498	18	18	29
New Zealand	16 476	19	19	21	Saudi Arabia	814	19	19	19	Russian Federation	2 222	19	23	—
China[2]	16 128	20	22	31	Chile	772	20	20	33	Israel	2 154	20	19	20
Scandinavia[3]	15 985	21	21	17	Spain	675	21	22	18	New Zealand	2 075	21	22	22
Indonesia	14 987	22	20	24	Scandinavia[3]	619	22	27	20	Scandinavia[3]	2 064	22	24	19
Saudi Arabia	13 164	23	23	16	New Zealand	592	23	24	25	Saudi Arabia	1 999	23	21	17
Philippines	12 696	24	24	22	Russian Federation	591	24	26	—	Indonesia	1 939	24	20	24
India	12 170	25	25	19	Indonesia	575	25	21	27	Philippines	1 637	25	26	23
Israel	11 512	26	26	23	Colombia	481	26	28	21	India	1 573	26	25	18
South Africa	10 748	27	27	30	Belgium	480	27	23	15	Belgium	1 295	27	27	21
Belgium	9 051	28	28	26	India	455	28	25	16	Pakistan	1 211	28	28	27
Mexico	9 012	29	31	18	Pakistan	413	29	29	26	Chile	1 175	29	29	43
Pakistan	8 758	30	29	27	Philippines	333	30	31	30	South Africa	1 170	30	30	30

1. Most 1996 data are computer-generated estimates; thus the ranking may change when final data become available.
2. Not including the Taiwan Province.
3. Three States, Denmark, Norway and Sweden, are partners in the consortium airline "Scandinavian Airlines System".
4. 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 and IATA.

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 (35 and 8 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 (18 and 12 per cent, respectively).

Scheduled: city-pair rankings

2.76 The 25 largest city-pair traffic flows in terms of passengers carried on international scheduled services represented a total of about 46 million passengers in 1995 (Table 2-8; owing to incomplete data it has not been possible to include figures for 1996). This represents some 11 per cent of the world total of international scheduled passengers. The table shows that of the 25 major passenger flows 13 involved international routes within eastern Asia, 6 routes were within Europe, and 2 routes each were across the North Atlantic, across North-Mid Pacific, and within North America. In terms of cities, London (7), Hong Kong (6) and Tokyo (6) appear most frequently. Almost all the city-pairs shown involve over-water sectors.

Non-scheduled

2.77 Total international non-scheduled passenger-kilometres performed throughout the world decreased by an estimated 12 per cent in 1996 (Table 2-9). In 1996 the share of international non-scheduled air passenger traffic decreased to some 13 per cent of over-all international air passenger traffic compared to some 16 per cent in 1995. Non-scheduled traffic in Europe remains the largest single component of the world charter market. Domestic non-scheduled passenger traffic is estimated to represent some 10 per cent of total non-scheduled passenger traffic and about 2 per cent of total domestic passenger traffic worldwide. Non-scheduled cargo operations tend to be largely of an ad hoc nature and little information is available as to their volume.

FLEETS

2.78 The evolution of the commercial air transport fleets summarized below does not generally include aircraft fleet and manufacturer data for the Russian Federation and China. However, statistics on certain types of aircraft manufactured in the Russian Federation and employed in the fleets of States other than the Russian Federation 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

2.79 In 1996 the number of turbo-jet aircraft ordered was 1 003 compared with 678 in 1995. The financial commitment represented by orders placed in 1996 for these aircraft is

Table 2-8. Scheduled passenger traffic on world's major international city-pairs
(top 25 city-pairs ranked by international passengers, 1995)

Rank	City-pair	Distance (km)	1995 (thousands)	1994 (thousands)	1995/94 %	1995/87 average
1	Hong Kong-Taipei	777	4 195	4 050	3.6	12.4
2	London-Paris	346	3 031	3 637	-16.7	2.1
3	London-New York	5 539	2 943	2 574	14.3	4.4
4	Dublin-London	456	2 765	2 456	12.6	10.8
5	Kuala Lumpur-Singapore	335	2 614	2 436	7.3	7.3
6	Honolulu-Tokyo	6 134	2 424	2 285	6.1	7.8
7	Bangkok-Hong Kong	1 743	2 285	2 074	10.2	7.4
8	Amsterdam-London	369	2 137	2 052	4.1	4.6
9	Hong Kong-Tokyo	2 938	2 043	1 881	8.6	2.9
10	Seoul-Tokyo	1 227	1 910	1 967	-2.9	6.8
11	Jakarta-Singapore	906	1 735	1 708	1.6	8.6
12	Taipei-Tokyo	2 182	1 600	1 540	3.9	0.8
13	Hong Kong-Singapore	2 578	1 596	1 490	7.1	6.9
14	Bangkok-Singapore	1 444	1 580	1 490	6.0	7.1
15	Frankfurt-London	654	1 542	1 410	9.4	4.9
16	Hong Kong-Manila	1 126	1 344	1 207	11.4	7.7
17	New York-Paris	5 833	1 189	1 151	3.3	1.8
18	Singapore-Tokyo	5 356	1 163	1 106	5.2	11.3
19	Brussels-London	349	1 142	1 207	-5.4	4.8
20	Los Angeles-Tokyo	8 752	1 112	1 024	8.6	1.6
21	New York-Toronto	587	1 108	890	24.5	1.4
22	London-Los Angeles	8 759	1 072	1 010	6.1	6.5
23	Chicago-Toronto	699	1 053	954	10.4	1.8
24	Bangkok-Tokyo	4 644	1 049	881	19.1	12.3
25	Hong Kong-Seoul	2 059	1 027	980	4.8	12.8
	TOTAL		45 659	43 460	5.1	7.0

Source: ICAO Air Transport Reporting Form B plus estimates for non-reporting air carriers.

Table 2-9. Estimated international non-scheduled revenue passenger traffic, 1995-1996

Category	1995 Pass.-kms performed (millions)	1995 Percentage of total carriers	1995 Percentage of total traffic	1996 Pass.-kms performed (millions)	1996 Percentage of total carriers	1996 Percentage of total traffic	Annual change (%) 1996/95
Scheduled carriers	112 700	49	—	129 700	63	—	15.1
Non-scheduled carriers	118 600	51	—	75 000	37	—	-36.8
TOTAL NON-SCHEDULED TRAFFIC	231 300	100	15.6	204 700	100	13.1	-11.5
TOTAL SCHEDULED TRAFFIC	1 252 900	—	84.4	1 363 400	—	86.9	8.8
TOTAL TRAFFIC	1 484 200	—	100.0	1 568 100	—	100.0	5.7

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

estimated to be about $65 billion, a little less than double the $36 billion estimated for 1995. In 1996, 491 aircraft were delivered compared with 481 aircraft in 1995. The backlog of unfilled orders increased from 2 032 aircraft at the end of 1995 to 2 501 aircraft at the end of 1996. The status of orders and deliveries for the year 1996 is shown in Table A1-2 in Appendix 1, which gives data by manufacturer and model for turbo-jet and turboprop aircraft.

2.80 The turbo-jet types shown in Table 2-10 were most active in 1996 in terms of orders and deliveries, accounting for about 87 per cent of the orders, and for about 63 per cent of the deliveries made and 81 per cent of the backlog of unfilled orders in 1996. The number of turboprop aircraft ordered in 1996 was 173, and 177 aircraft were delivered during the year. The backlog of turboprop aircraft was 184 at the end of the year.

Composition

2.81 Between 1987 and 1996 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 62 per cent, from 10 145 to 16 460, as shown in Table 2-11. During this period, the number of jet aircraft increased from 7 721 to 12 980, rising from about 76 per cent to 79 per cent of the fleet, while turboprop aircraft increased from 1 800 to 3 180, or from about 18 to over 19 per cent. On the other hand, the number of piston-engined aircraft declined by almost 52 per cent, from 664 to 300, and now constitutes a little less than 2 per cent of the total world fleet.

2.82 In December 1996, the Airclaims Group of London counted 632 western-built commercial jets in storage including 220 wide-bodies, i.e. some 50 aircraft fewer than in December 1995 and 471 fewer aircraft than in January 1994 when the number reached its

Table 2-10. Main aircraft types ordered and delivered in 1996

Aircraft	Orders	Deliveries	Backlog
Boeing 737	349	76	764
Airbus A319/320/321	220	72	521
Boeing 777	88	32	273
Boeing 747	66	26	161
Canadair RJ	60	52	51
Boeing 757	44	42	134
Airbus A330	42	10	113

Source: Aircraft manufacturers.

Table 2-11. Commercial transport fleet[1] at the end of each year — 1987, 1995, 1996[2]

	TURBO-JET		TURBOPROP		PISTON ENGINE		
Year	Number	Percent-age	Number	Percent-age	Number	Percent-age	Total aircraft all types
1987	7 721	76.1	1 800	17.7	624	6.2	10 145
1995	12 586	78.4	3 133	19.5	343	2.1	16 062
1996	12 980	78.9	3 180	19.3	300	1.8	16 460

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 Russian Federation are not included.

Source: ICAO Air Transport Reporting Form H.

peak. The fall in the over-all number of stored aircraft can be linked to the improving traffic growth with newer generation aircraft being put back into service, the permanent withdrawal of some older non-Chapter 3 aircraft and the cutback in production rates of new aircraft. The number of jets in the group available for lease or sale declined from 470 in December 1995 to 299 one year later, the lowest absolute number since the end of 1989. However, in terms of percentage of the total jet fleet, at 2.3 per cent it was lower by 1 percentage point than in 1989. The proportion of new generation aircraft available for lease or sale increased to 17.4 per cent, up by 1.2 percentage points from December 1995, suggesting an increase in new aircraft within this category of the world fleet.

2.83 Since the beginning of the jet era, the average age of the airlines' western-built jet fleet grew steadily from 4.4 years in 1970 to 9.1 years in 1980 and to 11.8 in 1990, declining in 1991-1992 to 11.5 years as a consequence of higher-than-average new deliveries. After 1992, the upward trend resumed and in 1996 the average age of the jet fleet reached 12.8 years, up from 12.4 years in 1995. Recent fleet forecasts calling for longer service life of existing jets, to 35 years and more, suggest that this trend may well continue. In 1996, some major international airlines opted to extend the life of their older fleets. Meanwhile, in May, a 26-year-old Trans World Airlines' Boeing 747-131 passed the 100 000 flying hours mark, believed to be a record for any type of aircraft, commercial, private, or military.

2.84 During the year the market value of older jets, whether wide- or narrow-body, decreased, with older models of certain aircraft types losing more in terms of percentage points than later models. For example, the value of the Boeing 747-100s decreased by some 30 per cent for the oldest aircraft and by 24 per cent for newer machines, whereas for the series -300 these numbers were, respectively, 21 and 10 per cent. Exceptions were the Boeing 727-100/100QC and -200 Advanced models and the older Boeing 707-320s (both passenger and cargo versions) for which demand drove prices up by 10 to 20 per cent. The trend for second-generation jets was in general very different; while the oldest aircraft of some models saw a moderate decline in their values (within 3 to 7 per cent on average), the rest of the group experienced appreciation between 10 and 30 per cent for different model/age categories of the Boeing 767-300, between 15 and 20 per cent for the Boeing 737-300s, and under 10 per cent for the majority of the other aircraft in this group.

Leasing developments

2.85 In the middle of 1996, there were 34 major leasing companies owning 1 760 jet aircraft compared with some 1 740 commercial jets owned by 36 companies in 1995. There was notable fleet renewal by leasing companies leading to an increase of its approximate aggregate value in excess of $41 billion compared with about $36 billion in 1995. More than 61 per cent of jet aircraft available for operating leases were owned by just two companies, both of which are based in the United States: General Electric Capital Aviation Services (724 aircraft) and International Lease Finance Corporation (349 aircraft).

2.86 In 1996, excluding China and the Russian Federation for which complete data were not available, the proportion of jet aircraft owned by major leasing companies decreased less than one percentage point to 13.5 per cent. The number of jets leased from other institutions, other carriers, the aircraft manufacturers, and smaller leasing companies of which many deal predominantly with turboprop aircraft is also significant. According to data provided by the Airclaims Group, at 31 December 1996 the world airlines owned 55.7 per cent of their western-built jet fleet of which 4.6 percentage points represented aircraft leased to other carriers, i.e. only about 51 per cent of fleets operated by airlines were their property.

2.87 In 1996, as in the three previous years, the share of stored aircraft in the total fleet owned by major leasing companies continued to decline (by 1.6 percentage points to 5.9 per cent), mostly due to a sharp reduction of stored wide-body aircraft whose share fell from nearly 14 per cent of those aircraft's total number in 1995 to less than 9 per cent in 1996.

Nevertheless, market conditions caused the leasing rates for aircraft in this category to continue to fall, with a few exceptions, by 10 to 30 per cent. Leasing rate increases, typically within 10 per cent, were recorded for nearly all Chapter 3 passenger narrow-bodies, though for such models as the Airbus A320-200, Boeing 737-300 and -400, and MD-82 rates increased by more than 20 per cent. Within the Chapter 2 narrow-body group, the Boeing 727-100C/QC, -200 and -200 Advanced, Boeing 737-200 Advanced, and all DC-9 models were in increasing demand with a consequent rise in leasing rates which, for a few models, were double the rates available the previous year. For other models in this aircraft group, there was a decrease in leasing rates over 1995.

AIRCRAFT TECHNOLOGY

2.88 The last of three engine/airframe combinations of the world's largest and newest twin-engine airliner, the Boeing 777 powered by the Rolls-Royce Trent 800 turbofan, received its type certificate from the United States Federal Aviation Administration (FAA) and Europe's Joint Aviation Authorities (JAA) and went into operation in June 1996. An increased gross weight version took to the air in the fall; weighing a maximum of 287 tonnes, it extended the 777's range up to 13 400 kilometres.

2.89 Airbus Industrie received a launch order for an extended range version of its A330 twin-jet, which will be able to fly 11 800 kilometres with some 260 passengers, and commenced production with deliveries planned for April 1998. The European manufacturer accelerated studies on two derivatives of its four-engine A340 wide-body jet: the A340-500 to carry 316 passengers for up to 15 400 kilometres and the A340-600 with 376 seats and a range of 13 700 kilometres. Boeing began offering the stretched Boeing 767-400ERX with 245 to 303 seats and a range of 10 460 kilometres. In early 1996, McDonnell Douglas delivered the first extended-range version (up to 13 300 kilometres) of its tri-jet MD-11 wide-body aircraft. The manufacturer decided to stop development of its proposed longer-range derivative of the MD-11, the MD-XX, which was intended to compete in the 309- to 375-seat category. In the Russian Federation, flight tests of the IL-96T freighter equipped with Pratt & Whitney engines and Rockwell Collins avionics were delayed by financial difficulties.

2.90 During the year, there were some notable developments in the mid-size medium-haul aircraft market. The newest member of the Airbus Industrie single-aisle family, the 124-seat A319 (powered by the CFM56-5B), achieved JAA certification in April. Another version equipped with IAE V2500 engines achieved certification in December. The Airbus A321-200, an upgraded version of the 185-seat A321-100, made its maiden flight in December. The -200 can seat 220 passengers and fly as far as 5 000 kilometres, about 650 kilometres farther than its predecessor. The McDonnell Douglas MD-90-30 was certified by JAA in October after more than 30 changes had been made to comply with European requirements (one of them was strengthening the skin and structure around the nose and tail to withstand a 1.5 kg bird strike).

2.91 In September, Boeing launched the 757-300 with first deliveries planned for 1999. With 225 to 289 seats, some 20 per cent more than for the basic 757-200, the aircraft is

expected to have a 10 per cent lower seat-kilometre cost. Range is estimated at about 6 500 kilometres, about 900 kilometres less than the model -200. In December, Boeing rolled out the first 737-700 (128 to 149 seats) with expected FAA/JAA certification in September 1997. Although the new 737 family has just 20 per cent spares commonality with existing 737 models, Boeing intends to certificate the aircraft as a derivative. The -700 typical range would be about 7 800 kilometres allowing it to operate lightly trafficked transatlantic and trans-Asian routes. Tupolev's 214-seat Tu-204 twin-jet started revenue passenger service in February, while its heavier long-range version, the Tu-214 (formerly known as Tu-204-200), also powered by Perm PS-90A engines, had its maiden flight. The Rolls-Royce RB211-535-powered version of Tu-204 was re-launched with a firm order from an Egyptian company, and a prototype began test flights in August.

2.92 In the regional aircraft market, one new 50-seat jet, the Embraer EMB-145, was certified, while three new models of existing aircraft entered airline operations in 1996: the Avions de Transport Regional (Aerospatiale/Alenia) ATR 42 Series 400, the Canadair Regional Jet Series 200, and the Dornier Do-328-120. The certification programme of the Indonesian Industri Pesawat Terbang Nusantara (IPTN) N-250 high-speed fly-by-wire turboprop was somewhat delayed, and construction of a final assembly factory in the United States was postponed. Expected delivery of the aircraft to the potential North American customers has been revised to early 2000. Four new generation regional jet programmes were under study, some of them closely approaching launch stage. One of these programmes, the AI(R) 70, based on an initial 70-seat version, was under development by the already established European group, Aero International (Regional), while three others, the Chinese-European-Singaporean Asean Express AE-100 90-140 seater, the Indonesian N-2130 with baseline 80- or 100-seat aircraft, and a Japanese (in yet to be decided partnership) YSX small passenger aircraft, were being developed by new players in the regional jet market.

2.93 In the United States, the second (and last) phase of the high-speed research (HSR) programme continued to find technologies to enable the launch of the high-speed civil transport (HSCT). One of the recent achievements of the programme was a new design for a prospective HSCT known as a technology-concept airplane (TCA). Major parameters include a maximum take-off mass of 335 tonnes, three-class accommodation for up to 310 passengers, a range of 9 200 kilometres, engine thrust of 220 kN, and a noise level that meets ICAO Annex 16, Chapter 3 requirements minus 3 dB.

2.94 Under the auspices of the HSR programme, the Tupolev supersonic test bed Tu-144LL started a series of 32 flights to compare full-scale flight data with those derived from wind tunnel models and computer-aided techniques. Japan announced the launch of an eight-year project to establish basic technology for HSCT, focusing more on the commercial and industrial side of the research in order to be prepared to contribute to an international programme if one emerges. Meanwhile, after 20 years in airline revenue service, the first-generation supersonic transport, Concorde, was expected to fly another 20 years at its present rate of use. The aircraft structure shows signs of low corrosion due in part to the drying effect of supersonic heating.

2.95 Boeing and four European aircraft manufacturers ended the joint feasibility study on very large commercial transport (VLCT) and continued their own studies separately

arriving at significantly different estimates of the market for such an aircraft: Boeing concluded that 470 aeroplanes with more than 500 seats will be delivered by 2014, whereas Airbus Industrie forecast 1 380 deliveries, including 477 aircraft in the 800- to 1 000-seat category. The European manufacturer began offering a double-deck A3XX (555-656 seats, or up to 800 seats in one class) with programme launch envisioned for 1998. Boeing was proposing two major derivatives (MDs) of the B747: the ultra-long -500MD which would carry 460 passengers up to 16 100 kilometres, and the -600MD with 550 seats and a range of 14 350 kilometres. Neither model was launched by the year's end because of the lack of committed customers. Both manufacturers priced their new products at around $200 million. Boeing also unveiled the configuration of a 650-seat -700X but noted that a market had yet to be confirmed. On the airport side, a survey of 32 major international airports conducted by Airports Council International revealed that introduction of VLCT would impose costs averaging $105 million per airport.

2.96 In 1996, the Rolls-Royce Trent 890 engine entered revenue service, becoming for the time being the world's most powerful jet engine in operation (certified at 400 kN). Growth versions of two other very large turbofan engines, the General Electric GE90-92 and the Pratt & Whitney PW4090, were certified at 409 kN and 400 kN of take-off thrust, respectively. Engines were under development for new generation aeroplanes of all categories, from VLCT to regional jets. To meet requirements of total operating cost reduction by 10 per cent on proposed B747 derivatives, two new engine families with a higher bypass ratio than any in service were launched: a joint General Electric/Pratt & Whitney GP7000 programme for engines within a 312-378 kN thrust range, with a 7.8 bypass ratio; and the Rolls-Royce Trent 900 engines for a 338-356 kN thrust range (8.6 bypass ratio). Both engines, suitable also for the proposed A3XX, were scheduled to enter into service in 2000.

2.97 CFM International's CFM56-7B turbofan, developed for the new Boeing 737 family, flew for the first time on a test-bed aircraft and was certified in December. The Perm PS-90 engine (a 157 kN version with its core designed to provide from 100 to 235 kN), intended to be the major powerplant for new generation Russian aircraft such as the IL-96-300, TU-204 and IL-76MF, was certified for series production about 3½ years after it entered commercial passenger operations in July 1993. Engines for new generation regional jets, primarily for the AE-100 and the IPTN N2130, were unveiled by Pratt & Whitney (PW6000, 67-107 kN) and by CFM International (CFM56-9, 82-102 kN), with certification of their products within three years after an official aircraft launch. BMW/Rolls-Royce planned to offer their BR715 turbofan, already selected for the MD-95, with certification scheduled for September 1998. Pratt & Whitney Canada and Snecma were developing the 53-71 kN SPW 14 to power the proposed AI(R) family of regional jets.

2.98 One of the major targets in engine development was an improvement in their environmental parameters. General Electric started to flight test its GE90-92B engine with an improved combustion system, with benefits including reduced emissions, particularly in carbon monoxide, hydrocarbons and oxides of nitrogen; deliveries of the engine were planned for the third quarter of 1997. Rolls-Royce was developing a new combustor for its RB 211-535E4B turbofan, targeting reduction of nitrogen oxide emissions by up to 40 per cent through implementation of technology developed for the Trent 700 and further refined for the Trent 800. The new engine modification was scheduled to enter service on the B757-300 in

the first quarter of 1999. General Electric received a five-year NASA contract to develop technologies considered critical for next generation subsonic commercial aircraft engines which would enable, in particular, reduction of nitrogen oxide emissions by 70 per cent, improvement of fuel efficiency by 8 per cent, cutting of direct operating costs by 3 per cent, and reduction in engine noise. Daimler-Benz aerospace (DASA) and the Tupolev Aircraft Design Bureau continued to work on hydrogen- and natural gas-fueled aircraft where nitrogen oxide emissions could be reduced to one-third of a conventional engine's level.

2.99 The second generation of wide-body twin jets continued to increase the capability of extended range operations by twin-engined aircraft (ETOPS). In October, both GE-90- and RR Trent 800-powered 777s received 180 minutes ETOPS approvals from the FAA, and in May the RR Trent 700-powered A330-300 was granted the same approval by JAA, thus making all engine/frame combinations of both aircraft capable of maximum ETOPS. Narrow-body twin jets also obtained ETOPS approvals. One of them, the A321, was awarded 120 minutes ETOPS for both the CFM56- and the IAE V2500-powered variants.

2.100 New technologies and equipment continued to be incorporated into commercial aeroplanes, making them safer and more economical. The B747-400 became the first jet airliner to be equipped and certified with a new air traffic management (ATM) system known as FANS 1. The new technology allows the -400 to make primary use of the global satellite positioning system (GPS) to determine accurate positions anywhere in the world. Airbus Industrie had begun delivering new aircraft equipped with a predictive wind shear warning system in addition to the existing reactive wind shear warning and guidance system. Tests of new enhanced ground proximity warning systems, with a 40- to 60-second warning instead of the 10 seconds provided by current equipment, were conducted on a Boeing 747-400 and on an Airbus A319.

2.101 CTT Systems of Sweden patented airborne equipment which takes away 90 per cent of the water condensate (which can weigh from 300 to 900 kilograms on aircraft such as the MD-80 and B767) from aircraft cabin insulation and fuselage cavities. Boeing entered into a licensing agreement with the company to offer production and retrofit provisions for the CTT zonal dryer system in its aircraft. An Airbus A340-300 with 30 per cent of its surface covered with riblets — a plastic film with microscopic grooves which is expected to reduce fuel consumption by reducing surface turbulence — started in-service testing.

2.102 Consolidation and new alliances were in evidence among the aircraft and engine manufacturers. The major event was a December announcement of the merger of two aerospace giants, Boeing and McDonnell Douglas. Two large U.S. engine manufacturers, General Electric and Pratt & Whitney, also decided to collaborate, establishing a joint venture called GE-Pratt Engine Alliance for developing an engine (GP7000) for a LCT. In Asia, a 100-seat jet (AE100) consortium was formed by Aviation Industries of China (AVIC), Singapore Technologies and Aero International Asia (AIA) — a division of AI(R). In Europe, Alenia agreed to participate in future Airbus projects (in particular, the A3XX and A340-600) and to become a member of the European consortium when Airbus completes its current reorganization into a limited company. U.S.-based Fairchild Aircraft acquired an 80 per cent share of Dornier Lufthart GmbH, a part of Daimler-Benz Aerospace AG (DASA) of Germany.

Two French aerospace companies, the state-owned Aerospatiale and Dassault Aviation, agreed to merge, while in the United States, Boeing took over Rockwell's aerospace and defence-electronics businesses. Russian aircraft maker Aviastar formed a partnership, Aviastar Asia Corp., with three Asian companies to set up a marketing, assembly and maintenance centre in the Chinese province of Taiwan for its TU-204 passenger jet and An-124 cargo aircraft; similar plans were also announced by another Russian aircraft manufacturer, Saratov Aviation, for its three-engine Yak-142 regional jet. The Islamic Republic of Iran and Ukraine agreed to share manufacturing of the Antonov An-140 50-seat twin turboprop regional airliner in the Islamic Republic of Iran, starting in March 1998.

2.103 During the year there were a few new co-operative initiatives by Russian aerospace companies and western manufacturers. A number of programmes to equip Russian airframes (An-124, An-38, IL-96, IL-86, Tu-204 and Tu-334) with Western-built engines were under way at different stages of implementation. DASA withdrew from its 1993 strategic partnership with Fokker Aircraft B.V., which subsequently declared bankruptcy. By year's end, none of the rescue plans studied by some potential local and foreign buyers materialized, spelling the end of 77 years of aircraft manufacturing in the Kingdom of the Netherlands. The rescue bids were further complicated when Short Brothers of Belfast, which made wings for Fokker F70 and F100 regional jets, decided in November to close down production.

PERSONNEL

2.104 Between 1995 and 1996 there was little change in the number of staff employed by the world's scheduled airlines (excluding those of the Russian Federation and China). Preliminary estimates suggest that in 1996 the number amounted to about 1.54 million, compared with 1.52 million in 1995. The number of staff employed by the international scheduled airlines (about 1.15 million in 1996) showed an increase over 1995.

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 lay-offs by others, which in many instances do not involve the same personnel.

2.106 Airlines continued their efforts to reduce labour cost or to restrict its growth, in particular by renegotiating contracts with their employees, notably in Europe and North America. Some major carriers managed to negotiate reduction in wages in exchange for such benefits as job security, stock options, participation in a profit-sharing plan, or representation on the board. Other carriers agreed on maintaining current salary levels in exchange for concessions from the staff in terms of increased productivity, work rules, elimination of jobs, etc. Yet others accepted plans for pay raises in exchange for concessions from their employees.

2.107 In 1996 about two dozen airlines were reportedly affected by the industrial actions of their staff, with Europe the scene of the majority of these actions. On a global basis, pilot and cabin crews unions were the most active in staging industrial actions.

FINANCES

Financial results

2.108 Preliminary estimates for 1996 indicate that the world's scheduled airlines as a whole experienced an operating profit of 4.3 per cent of total operating revenues, compared with 5.1 per cent in 1995. This is the fourth successive year of operating profit following three years of operating losses (1990-1992). The operating revenues of scheduled airlines (excluding operations within the Commonwealth of Independent States — CIS) are tentatively estimated at $281.5 billion in 1996, an increase of some 5 per cent compared with the $267.0 billion earned in 1995. Expressed in United States currency, operating revenues per tonne-kilometre performed fell from 87.3 cents in 1995 to an estimated 85.4 cents in 1996. The operating expenses for the same airlines are tentatively estimated at $269.5 billion in 1996, an increase of 6 per cent over the $253.5 billion incurred in 1995. Operating expenses per tonne-kilometre performed decreased slightly by about 1 per cent from 82.9 cents in 1995 to 81.8 cents in 1996.

2.109 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 1996, the estimated operating profit of about $12 billion was at a lower level than the 1995 operating profit of $13.5 billion. The smaller operating profit in 1996 reflects cost pressures, notably from higher fuel prices, a higher value of the United States dollar in relation to other world currencies, and a levelling out in the average load factor despite the strong traffic growth.

2.110 In 1996, 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 1996 was a profit of $6.0 billion, marginally higher than the profit of $5.6 billion experienced in 1995. For the airlines of the rest of the world combined (excluding operations within the CIS), the preliminary estimated operating profit in 1996 is $6.0 billion, lower than the operating profit of $7.9 billion shown for 1995.

2.111 The net result is derived from the operating result by taking into account the non-operating items and taxes. Preliminary estimates suggested that in 1996 the net result for the world's scheduled airlines would be better than in 1995 due to lower interest rates, improved airline balance sheets and less money spent by airlines in 1996 for restructuring. Information on both operating and net results over the period 1985-1996 and distribution of operating revenues and expenses by item in 1985 and 1995 may be found in Tables 5-4 and 5-5 in Chapter 5.

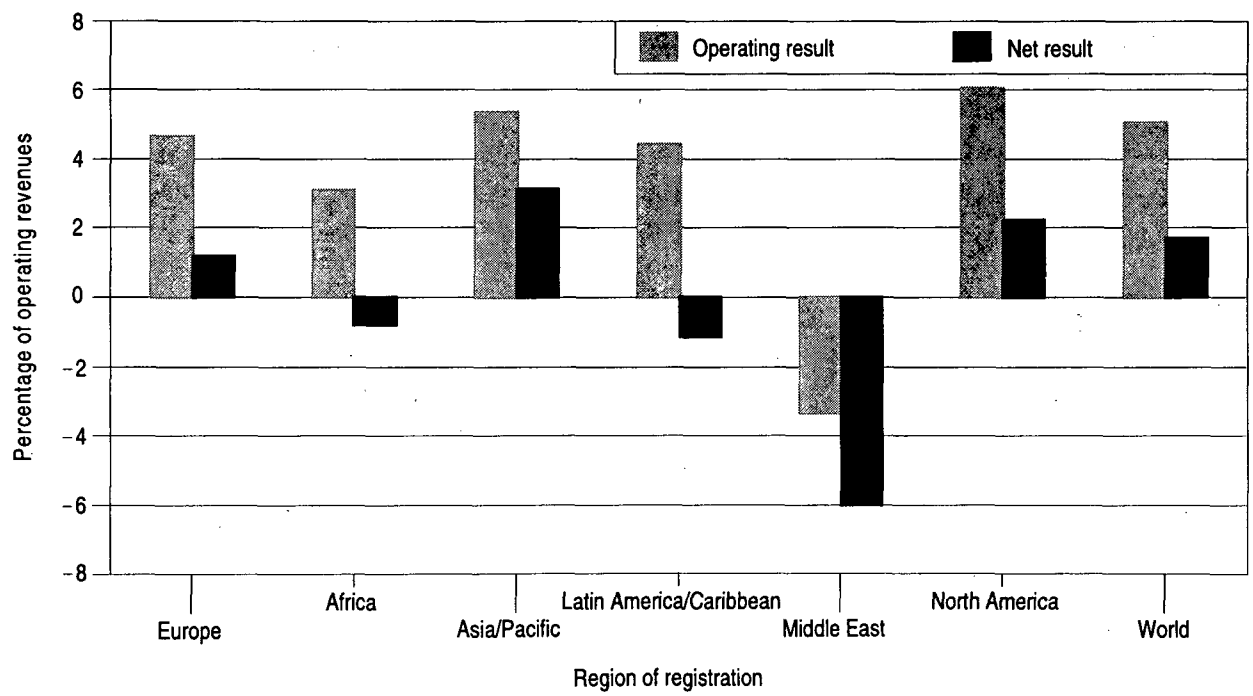
2.112 The estimates of the world's scheduled airlines as a whole do not portray the considerable difference in results achieved by individual airlines. In 1995 (complete data were not available for 1996 at the time of writing) about 70 per cent of airlines experienced operating profits, with 30 per cent reporting operating losses. On a regional basis, airlines in all ICAO statistical regions, except the Middle East, experienced positive aggregated operating results in 1995, with operating profits expressed as a percentage of operating revenues

ranging from 6.1 per cent for the airlines in North America to 3.1 per cent for those based in Africa. Net results ranged from a surplus of 3.1 per cent of operating revenues for the airlines based in Asia/Pacific to a net loss of 6 per cent of operating revenues for those in the Middle East (Figure 2-2).

2.113 Available data on non-scheduled carriers are insufficient to produce accurate financial estimates.

Consolidated balance sheet

2.114 At the end of the fiscal year 1995 (1996 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 $332.7 billion, compared with $310.6 billion at the end of the fiscal year 1994 (Table 2-12). Of these, 25 per cent were represented by current assets, some 59 per cent by fixed assets and the remainder by other assets.



Source: ICAO Air Transport Reporting Form EF-1.

Figure 2-2. Financial results by region in 1995 — scheduled airlines

Table 2-12. Consolidated balance sheet Scheduled airlines of ICAO Contracting States[1] End of fiscal years 1987, 1994 and 1995

	1987		1994		1995	
	U.S.$ (millions)	% of total	U.S.$ (millions)	% of total	U.S.$ (millions)	% of total
ASSETS						
Current assets	47 460	30	75 690	24	84 530	25
Fixed assets						
Flight equipment	75 570	48	144 370	46	152 990	46
Ground property and equipment	16 050	10	27 160	9	28 450	9
Land	740	0	2 730	1	3 860	1
Investments in affiliated companies	2 760	2	14 010	5	10 010	3
Other assets	16 040	10	46 600	15	52 890	16
TOTAL ASSETS	158 620	100	310 560	100	332 730	100
LIABILITIES						
Current liabilities						
Current liabilities	37 930	24	72 790	23	80 170	24
Unearned transportation revenues	10 540	7	15 710	5	17 100	5
Long/medium-term liabilities						
Long-term debt	52 840	33	116 040	37	114 320	34
Other medium/long-term liabilities	19 660	12	54 300	17	60 640	18
Stockholders' equity						
Share capital	13 880	9	23 710	8	27 540	8
Other capital	23 770	15	28 010	9	32 960	10
TOTAL LIABILITIES	158 620	100	310 560	100	332 730	100
ACCUMULATED DEPRECIATION						
Flight equipment	49 020	78	95 130	77	106 150	77
Ground property and equipment	13 680	22	28 440	23	31 970	23
TOTAL ACCUMULATED DEPRECIATION	62 700	100	123 570	100	138 120	100

1. Excludes domestic operations within the CIS.

Source: ICAO Air Transport Reporting Form EF-1.

2.115 At the end of 1995, the net value of the aircraft fleet (i.e. after depreciation charges) was $153.0 billion, compared with $144.4 billion at the end of 1994, representing an increase of some 6 per cent, although it remained at about 46 per cent of total assets. Accumulated depreciation charges stood at about $138.1 billion of which $106.2 billion were for the aircraft fleet, representing some 41 per cent of the gross value of the fleet. The remaining accumulated depreciation charges covered ground property and equipment and represented some 53 per cent of their gross value.

2.116 Between the fiscal years 1994 and 1995, the value of stockholders' equity increased by some 17 per cent (from $51.7 billion to $60.5 billion), and in relative terms it increased from 17 to 18 per cent of total liabilities. During the same period long-term debt decreased from $116.0 billion to $114.3 billion and, in relative terms, from 37 to 34 per cent of total liabilities. At the end of fiscal year 1995 current liabilities, including unearned transportation revenue, stood at $97.3 billion, or some 29 per cent of total liabilities, compared with some 28 per cent in 1994. Hence, during 1995 airlines started using funds to improve their balance sheets by reducing long-term debt. Unearned transportation revenue represented about 5 per cent of total liabilities and some 6 per cent of the total traffic revenue for 1995.

2.117 Long-term trends in the balance sheet elements may be discerned from comparing the figures for 1995 with those for 1987, which are also contained in Table 2-12. At the end of fiscal year 1995, total assets stood at $332.7 billion compared with $158.6 billion at the end of 1987. Relative to the totals, the most significant difference between 1987 and 1995 is the decrease in the proportion of current assets (from 30 to 25 per cent of the total) and the corresponding increase in other assets. The proportion of fixed assets is virtually the same in both years (about 60 per cent of total assets in 1987 and 59 per cent in 1995); however there was a slight relative increase in investment in affiliated companies (from about 2 per cent of total assets in 1987 to 3 per cent in 1995), and a reduction in the relative amounts represented by flight equipment and ground property and equipment.

2.118 As regards liabilities, between 1987 and 1995 there was a reduction in the proportion of current liabilities including unearned transportation revenue (from 31 to 29 per cent of total liabilities) and stockholders' equity (from 24 to 18 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 1987 and 1995 there was a significant decrease in relative terms due to the smaller net balance of unappropriated retained earnings (i.e. cumulative profit) at the end of fiscal year 1995 and a small decrease in proportion of share capital and capital surplus.

GENERAL AVIATION

2.119 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 1995 and available 1996 data for those 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 1996. 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.

2.120 General aviation flying in ICAO Contracting States (excluding the Russian Federation and China) is estimated to have remained at the level of 1995, i.e. an estimate of about 38 million hours (Table 2-13). Of this total for 1996, an estimated 9 million hours (24 per cent) were flown in instructional flying, 20 million hours (52 per cent) in business and pleasure flying and 9 million hours (24 per cent) in aerial work and other flying. The total of 38 million general aviation flying hours compares with a total of about 30 million hours flown on scheduled services by the airlines of the same Contracting States in 1996.

2.121 The number of civil aircraft on register in ICAO Contracting States (excluding the Russian Federation and China), operated by other than commercial air transport operators and mostly utilized in general aviation activities, increased slightly from 336 670 at the end of 1994 to an estimated 337 910 at the end of 1995. During the same period, the number of fixed-wing aircraft also increased marginally, from 320 970 to an estimated 321 998; the United States accounts for about 71 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 1995.

2.122 The number of valid private pilot licences at the end of 1996 in ICAO Contracting States (excluding the Russian Federation and China) was estimated at about 562 000, at about the same level as in 1995.

Table 2-13. Estimated number of hours flown in general aviation activities, 1995-1996
(excluding the CIS and China)

	Millions of hours	
Type of flying	1995	1996
Instructional	9.0	9.0
Business/pleasure	20.5	20.5
Aerial work/other	8.5	8.5
TOTAL	38.0	38.0

Source: ICAO survey on aviation activities.

Chapter 3
Airports and Air Navigation

3.1 This chapter discusses developments in 1996 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 A particularly noticeable development in 1996 was the increased attention given to more active private involvement in airport operations, management and financing. In Canada, earlier plans were put into effect, transferring the management and operation of Toronto, Winnipeg and Ottawa airports to autonomous local airport authorities. In Australia, the Government decided to establish long-term leasehold arrangements for federal airports, including in this process the international airports serving Brisbane, Melbourne and Perth. In China, Xiamen International became the first airport to float a stock issue, and in Cambodia the Government transferred the management and operation of Phnom Penh International Airport to a consortium comprising French, Malaysian and Cambodian partners.

3.3 In Italy, BAA plc (formerly known as British Airports Authority plc) purchased a controlling equity stake in GESAC, the operating company of Naples-Capodichino, Italy's fourth largest airport; Aeroporti di Roma, operator of Rome's Fiumicino and Ciampino airports, planned to float initially 40 to 49 per cent of its equity capital on the stock market in 1997; also consideration was given to pursuing more active private sector involvement with regard to Milan's two airports, Linate and Malpensa. In Portugal, the Government planned to sell the airports currently operated by Aeroportos e Navegaçao (ANA), with the air traffic control services element of ANA to be provided by a separate State-owned company.

3.4 In Mexico, steps were taken to start the process of long-term leasing of 58 airports including those serving Mexico City, Cancun, Acapulco and Guadalajara. In Argentina, the transfer of 59 airports to local and foreign operators through concessions and management contracts was approved. In Chile, four airports, including Santiago's Merino Benitez, were offered for management concessions. In Bolivia, a foreign management company was selected to operate La Paz, Santa Cruz and Cochabamba airports under a 25-year contract; air traffic control will continue to be the responsibility of the Airport Authority of Bolivia. In Jamaica, consideration was given to transferring commercial operations at Norman Manley and Sangster airports to private sector operators.

3.5 The trend towards providing air navigation services through autonomous authorities continued in 1996, but private involvement was not as actively pursued as it was in the case

of airports. In Canada, the transfer was completed of the air navigation services (air traffic control and flight information services) provided by Canada to a not-for-profit corporation (Nav Canada). In the United Kingdom, the planned new air traffic control centre at Prestwick in Scotland will be the first centre to be built under a private finance initiative.

3.6 In the United States, regulatory arrangements were completed for the introduction of air navigation services charges to be levied on traffic overflying but not landing on United States territory.

3.7 On the international scene, eleven States in Europe agreed to participate on a voluntary basis in the Satellite Distribution System (SADIS) Cost Allocation and Recovery scheme (SCAR). The SADIS distributes meteorological data to States in Europe, Africa, the Middle East and the western part of Asia. The SCAR scheme, which is open to voluntary participation by any State being served by SADIS, is administered by ICAO.

MAJOR AIRPORT PROJECTS

3.8 There were 1 119 airports in the world at the end of 1996 open to international civil aviation. Construction continued on a number of new airports around the world. In the Asia/Pacific region, both Chek Lap Kok (Hong Kong) and Kuala Lumpur International (Malaysia) are due to open in 1998. In China, phase I of Nanjing-Lukou International at Jiangsu is now expected to be completed in 1997; construction of the new Meilin international airport at Haikou, the capital of Hainan, has started; and new international airports for Guangzhou at Huadu and for Shanghai Pudong area were approved. On the other hand, work on a new airport for Bangkok (Thailand) was suspended, the intent being instead to expand Don Muang International. In Europe, the new Oslo airport at Gardermoen (Norway) is to become operational by the end of 1998; and Athens-Sparta (Greece) at the end of 1999. In Africa, the new Maun airport (Botswana) is close to completion. A decision has been made in principle to construct a new international airport for Paris (France) to be completed after 2015; and plans are under study for new international airports for Amsterdam (Kingdom of the Netherlands), Bombay (India), Tokyo (Japan), Quito and Guayaquil (Ecuador), and for Durban (South Africa).

3.9 Major airport expansion projects were under way in all regions in 1996. Projects completed during the year included new passenger terminals for Sydney's Kingsford-Smith (Australia), Helsinki-Vantaa (Finland) and Vancouver (Canada). Work continued on rebuilding Beirut International (Lebanon). New terminals were under construction at New York's John F. Kennedy and at Washington National airports (both in the United States), Budapest-Ferihegy (Hungary), Palma de Mallorca (Spain), Beijing Capital Airport (China), Phnom Penh's Pochentong (Cambodia), Lahore (Pakistan), Manila (Philippines), NoiBai (Viet Nam), Algier's Houari Boumedian (Algeria) and Tunis-Carthage (Tunisia). Development of new terminals was in advanced stages of planning for Munich (Germany), Madrid's Barajas (Spain), Prague (Czech Republic), London-Heathrow (United Kingdom), Cairo (Egypt), Abu Dhabi (United Arab Emirates), Istanbul (Turkey), Orlando and Chicago (both in the United States), Toronto's Pearson (Canada), Havana (Cuba), and Changi (Singapore).

3.10 New runways for Dallas/Fort Worth (United States), Vancouver (Canada) and for Pusan-Kimhae (South Korea) were opened; and major construction development projects got under way for Milan (Italy), Berlin-Schoenefeld (Germany), Zurich (Switzerland), Miami and San Francisco (both in the United States), and for Tokyo-Haneda (Japan). Completion of Madrid-Barajas' (Spain) third runway is scheduled for 1999, and Tokyo-Narita's (Japan) second runway for 2000. New runways were being planned for Manchester (United Kingdom), Madeira/Funchal (Portugal), Helsinki-Vantaa (Finland), Paris-Charles de Gaulle (France), Barcelona (Spain), Denver (United States), Kansai International (Japan), Amsterdam-Schiphol (Kingdom of the Netherlands) and Addis Ababa-Bole (Ethiopia).

AIRPORT TRAFFIC

3.11 The 25 largest airports in the world in terms of passenger throughput, 16 of which are located in the United States, handled a combined total of about 933 million passengers in 1996 (Table 3-1). This represents about 32 per cent of the world total of scheduled and non-scheduled passengers or an average per airport of some 102 000 passengers every twenty-four hours. These 25 airports also handled a combined total of about 10 million aircraft movements in 1996, corresponding to an average per airport of one take-off or landing every 74 seconds.

3.12 There are significant differences between the rankings of airports by passengers and by movements. For example, Tokyo-Haneda ranks 6th in terms of passengers handled but 48th in terms of aircraft movements, Frankfurt 8th by passengers but 19th by movements, and Hong Kong 17th by passengers but 56th 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 Boston (9), Pittsburgh (14), Charlotte (16), Seattle(17), Philadelphia (21), and Cincinnati (18).

3.13 Table 3-1 also includes 1987 data to illustrate the longer-term rate of growth of airport traffic. Passengers handled at the large airports concerned increased at about 4.5 per cent per annum on average over the 1987-1996 period, while aircraft movements increased at some 2.5 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.

3.14 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 455 million passengers in 1996, or about 46 per cent of the world total of international scheduled and non-scheduled passengers.

3.15 Over the 1987-1996 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 14 per cent, Bangkok, Hong Kong and Singapore each at 10 per cent). Seoul also achieved the highest annual growth rate in terms of international aircraft

Table 3-1. Scheduled and non-scheduled traffic at world's major airports (top 25 airports ranked by TOTAL passengers, 1996)

Rank No.	Airport (ranking by total commercial aircraft movements given in brackets)	Passengers embarked and disembarked				Aircraft movements			
		1996 (thousands)	1995 (thousands)	Change 1996/95 (%)	Average change per annum 1996/87 (%)	1996[1] (thousands)	1995 (thousands)	Change 1996/95 (%)	Average change per annum 1996/87 (%)
1	Chicago (1)	69 133	67 255	2.8	2.3	836.5	828.2	1.0	1.8
2	Atlanta (4)	63 345	57 735	9.7	3.2	579.9	578.2	0.3	-3.0
3	Dallas/Ft. Worth (2)	58 035	55 771	4.1	3.7	833.1	864.2	-3.6	3.8
4	Los Angeles (3)	57 975	53 909	7.5	2.9	733.3	703.1	4.3	2.3
5	London-Heathrow (12)	56 038	54 132	3.5	5.5	426.8	421.3	1.3	3.7
6	Tokyo-Haneda (48)	46 632	45 823	1.8	5.1	202.5	201.7	0.4	3.4
7	San Francisco (15)	39 247	36 260	8.2	3.1	399.3	396.1	0.8	-1.5
8	Frankfurt (19)	38 761	37 401	3.6	6.2	372.0	365.8	1.7	4.1
9	Seoul (46)	34 708	30 687	13.1	17.1	221.0	197.0	12.2	15.2
10	Miami (6)	33 505	33 236	0.8	3.8	462.4	498.8	-7.3	4.8
11	Denver (13)	32 264	31 028	4.0	0.0	416.5	437.0	-4.7	-1.5
12	Paris-Charles de Gaulle (22)	31 824	27 995	13.7	7.9	360.4	325.3	10.8	9.8
13	New York-Kennedy (25)	31 015	30 328	2.3	0.3	334.6	323.6	3.4	2.9
14	Detroit (7)	30 614	29 013	5.5	5.0	455.0	432.1	5.3	3.4
15	Las Vegas (22)	30 471	28 001	8.8	8.5	343.4	363.0	-5.4	2.7
16	Phoenix (11)	30 377	27 820	9.2	8.3	427.0	417.0	2.4	3.3
17	Hong Kong (56)	30 212	27 424	10.2	10.1	161.5	150.4	7.4	9.0
18	Minneapolis (8)	29 612	26 783	10.6	5.8	442.7	413.0	7.2	4.9
19	New York-Newark (10)	29 073	26 567	9.4	2.4	428.4	399.6	7.2	2.8
20	Amsterdam (27)	27 753	24 857	11.7	8.5	316.9	290.7	9.0	6.8
21	Paris-Orly (36)	27 365	26 577	3.0	3.3	244.1	232.7	4.9	4.0
22	St. Louis (5)	27 275	25 719	6.0	3.3	469.3	474.0	-1.0	3.0
23	Houston (20)	26 476	24 725	7.1	6.2	371.0	353.7	4.9	4.0
24	Orlando (30)	25 549	22 470	13.7	6.2	305.7	309.1	-1.1	3.8
25	Tokyo-Narita (79)	25 408	22 326	13.8	3.1	122.2	121.0	1.0	-8.7
	TOTAL	932 666	873 842	6.7	4.5	10 265.6	10 096.6	1.7	2.5

1. Aircraft movements for 1996 have been estimated.

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, 1996)

Rank No.	Airport (ranking by international commercial aircraft movements given in brackets)	International passengers embarked and disembarked				International aircraft movements			
		1996 (thousands)	1995 (thousands)	Change 1996/95 (%)	Average change per annum 1996/87 (%)	1996[1] (thousands)	1995 (thousands)	Change 1996/95 (%)	Average change per annum 1996/87 (%)
1	London-Heathrow (1)	48 257	46 830	3.0	6.0	352.8	348.3	1.3	5.1
2	Frankfurt (4)	31 017	30 168	2.8	7.1	291.9	287.0	1.7	5.7
3	Hong Kong (10)	29 543	27 424	7.7	9.9	161.3	150.2	7.4	9.1
4	Paris-Charles de Gaulle (2)	28 761	25 534	12.6	7.9	316.7	285.8	10.8	9.4
5	Amsterdam-Schiphol (3)	27 088	24 709	9.6	8.3	305.1	279.9	9.0	6.9
6	Singapore (9)	23 130	21 743	6.4	9.8	167.4	156.3	7.1	9.8
7	Tokyo-Narita (17)	22 666	21 488	5.5	7.9	117.3	116.1	1.0	3.9
8	London-Gatwick (8)	22 031	20 604	6.9	2.1	174.4	159.4	9.4	1.8
9	New York-Kennedy (20)	17 307	17 051	1.5	-0.2	100.3	97.0	3.4	0.3
10	Los Angeles (33)	16 546	13 406	23.4	9.6	78.0	74.8	4.3	5.3
11	Bangkok (18)	16 381	15 119	8.3	9.9	114.6	106.5	7.6	8.6
12	Miami (12)	14 913	14 443	3.3	6.3	151.1	163.0	-7.3	3.4
13	Zurich (6)	14 813	13 960	6.1	4.9	197.7	187.2	5.6	5.6
14	Seoul (30)	14 705	13 369	10.0	13.6	91.0	81.1	12.2	14.0
15	Taipei (22)	13 586	12 586	7.9	n/a	97.4	88.5	10.0	n/a
16	Brussels (5)	13 358	12 503	6.8	8.8	239.0	221.7	7.8	10.3
17	Copenhagen (7)	12 689	11 800	7.5	5.5	194.9	174.5	11.7	5.2
18	Rome-Fiumicino (15)	12 474	11 833	5.4	8.2	125.4	111.0	13.0	7.1
19	Toronto (11)	11 521	10 618	8.5	4.2	156.9	142.6	10.0	5.7
20	Palma de Mallorca (32)	11 338	10 969	3.4	4.3	78.4	70.1	11.9	3.8
21	Dusseldorf (19)	11 052	11 052	0.0	6.4	106.6	110.2	-3.3	5.3
22	Manchester (21)	10 926	12 135	-10.0	6.8	97.7	101.3	-3.6	5.7
23	Paris-Orly (23)	10 590	11 044	-4.1	4.4	96.0	91.5	4.9	4.1
24	Madrid (16)	10 223	9 510	7.5	8.4	119.7	108.5	10.3	9.2
25	Munich (14)	9 664	8 838	9.3	8.2	126.0	115.6	9.0	6.7
	TOTAL	454 580	428 736	6.0	7.1	4 057.4	3 828.1	6.0	6.5

1. Aircraft movements for 1996 have been estimated.

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

movements (14 per cent, followed by Brussels and Singapore each at 10 per cent, and Bangkok, Hong Kong, Madrid and Paris-Charles de Gaulle each at 9 per cent).

AIRPORT FINANCES

3.16 The number of profitable international airports continued to increase, mainly major airports in Europe and North America and airports with a high volume of traffic in other regions of the world. However, the majority of the 1 119 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.

3.17 There was a small increase in 1995 in the share which landing and associated airport charges represent in total airline operating expenses (1996 data were not available at time of writing). That share was 4.5 per cent in 1995 compared to 4.4 per cent recorded in 1994.

AIR NAVIGATION FACILITIES AND SERVICES

3.18 In 1995 the share which route facility charges represent in total airline operating expenses increased to 2.8 per cent from 2.7 per cent in 1994 (1996 data were not available at time of writing). This is primarily a reflection of the growing emphasis by States in general towards increasing their cost recovery in providing air navigation services.

3.19 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

3.20 Implementation of communications, navigation, and surveillance/air traffic management (CNS/ATM) systems continued at an ever-increasing pace, allowing States to gain valuable experience. Early benefits of CNS/ATM were being realized through the opening of new ATS routes, e.g. over the vast airspaces of China and the Russian Federation as well as in other parts of Asia, while reduced separation standards were being introduced in the Pacific and in parts of Asia, based on required navigation performance (RNP). Communication via data link was increasingly being used for transmission of ATM-related information, for example, for the delivery of oceanic clearances, pre-departure clearances and weather information. Many regions were conducting trials and experiments, using controller-pilot data link communications (CPDLC) and other data link applications for a broad range of ATM communications. In the field of navigation, Japan, the United States and European States are committed to implementation of global navigation satellite system (GNSS) augmentation

systems, and progress was achieved by all of these States. Finally, automatic dependent surveillance (ADS) was being used as a supplemental means of monitoring aircraft in a number of oceanic and continental airspaces.

3.21 Work continued in a number of States and international organizations, with industry input, on developing and assessing candidate architectures for Aeronautical Telecommunications Network (ATN) subsystems. Work also continued in the development and assessment of technologies, such as time-division multiple access (TDMA) digital voice/data systems, to improve VHF communication spectrum utilization.

3.22 Controller-pilot data link communication (CPDLC), which allows controllers to communicate via data link, is being used increasingly to communicate with suitably equipped aircraft in oceanic and remote areas of the world.

3.23 Significant progress continued in a number of States and international organizations in global navigation satellite system (GNSS) development and implementation. The ICAO GNSS Panel continued development of SARPs for GNSS.

3.24 Development of satellite-based augmentation systems continued in a number of regions. This form of augmentation has the potential to support sole-means use of GNSS for all phases of flight down to Category I precision approach. Several architectures for ground-based augmentation systems which have the potential to support Category II/III precision approach applications also continue to be developed and tested. This type of augmentation may be used by some States as an alternative in support of Category I operations. A number of States have approved global positioning system (GPS) for supplemental or primary use for some operations and types of airspace. Additional global orbiting navigation satellite system (GLONASS) satellites were launched during the year, and this system neared initial operational capability. The European Space Agency (ESA), EUROCONTROL and the European Commission, under an agreement known as the Tripartite Agreement, are continuing work on the European geostationary navigation overlay service (EGNOS). This service is scheduled for initial operational capability in 1998. As a possible alternative to EGNOS, a northern European automatic dependent surveillance (ADS)-broadcast network trial is being carried out by Denmark, Germany and Sweden, with the co-operation of Lufthansa and Aeroflot Soviet Airlines. The objective of the trial is to develop a local area augmentation system.

3.25 A number of multinational facilities and services have been developed in line with ICAO world-wide provisions. Some of these, such as the world area forecast centre in London and the satellite distribution system for WAFS products, also known as SADIS, are intended to serve air navigation systems in several ICAO regions.

3.26 Considerable progress continued to be reported during the year in improving surveillance capabilities. This included development of automatic dependent surveillance (ADS) and implementation of new radar systems, such as monopulse secondary surveillance radar (SSR) and SSR Mode S stations.

3.27 ADS trials, called ADS Europe, were carried out using the ATN. These trials have provided valuable information on implementation of an ATN-based network and on the

SATCOM infrastructure. In addition, Norway has been carrying out trials called *modified-ADS*, which involve the carriage and use of ADS by helicopters. The trial, which is also based on the ATN, has proven to be very successful; it is anticipated that the entire helicopter fleet operating in the Norwegian sector of the North Sea will be equipped by 1999, which should significantly improve safety in this remote area.

Air traffic management

3.28 Air traffic control systems around the world continued to be updated as part of the evolutionary process leading to a future global air traffic management system. Supporting CNS/ATM systems were being implemented with a view to achieving early benefits as well as meeting long-term requirements. Several regions developed ATM operational concepts, aimed at the progressive introduction of CNS technology in support of integrated ATM systems. This comprehensive approach should lead to a progressive and balanced implementation of CNS/ATM systems.

3.29 Modernization of systems was achieved through introduction of multi-radar tracking systems, raster scan colour displays, new flight plan data processing systems and air traffic control (ATC) simulators. Moreover, in areas where the implementation of radar service was not possible or practicable, ADS and controller-pilot data link communication (CPDLC) systems were introduced to provide air traffic control with additional surveillance and intervention capability.

3.30 Many States developed short- and medium-term programmes and ordered equipment to update their ATC systems within the near future. ATC improvements and operational procedures were being developed to support the integration of airborne and ground ATC systems components. In the European region, the Central Flow Management Unit (CFMU) of EUROCONTROL started its tactical operations as planned and is now assuming responsibility for air traffic management service throughout the European Civil Aviation Conference (ECAC) area, making better use of available capacity.

3.31 Major milestones were achieved concerning the use of required navigation performance (RNP) as an integral tool for airspace planning and implementation of CNS/ATM systems. In parallel with developments associated with RNP, the concept of required communication performance (RCP) will allow airspace planners to develop the airspace infrastructure based on ATM operational requirements. The implementation of RNP, together with the progressive introduction of area navigation (RNAV) techniques in compliance with RNP requirements, was 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.

Aerodromes

3.32 Future larger aeroplanes with wing spans greater than 65 m (larger than the B747-400) and capable of carrying more than 550 passengers may enter service by the year 2000, and they would have an impact on the airport infrastructure. Amended specifications on airport design are required to accommodate these aeroplanes.

3.33 States are required to evaluate and publish the strength of airport pavements. A review by ICAO of the current procedures for pavement design/evaluation indicated the inherent limitations of the procedures currently used for the design of aerodrome pavements for some types of new larger aeroplanes equipped with six or more wheels per strut (e.g. Boeing 777). A review of the other design methods available indicated the need to identify more mature and globally acceptable procedures. In this context, a full-scale research project is being planned in one State.

3.34 Annex 14, Volume I, recommends halogenated carbons (halons) as one of the three complementary fire extinguishing agents for aerodrome rescue and fire fighting. However, as a result of the *Montreal Protocol on Substances that Deplete the Ozone Layer*, the production of halons ceased on 31 December 1993. Since then, only remaining stocks of halons and recycled halons have been permitted for essential uses until a suitable alternative is identified. In this regard, research in the industry is being monitored by ICAO in order to keep the related specifications current.

Aeronautical meteorology

3.35 The tendency towards the centralization and commercialization of meteorological forecast services continued in 1996. Developments continued towards computer preparation of global forecasts of significant weather by the world area forecast centres (WAFCs). As a result, the significant weather (SIGWX) charts for Europe, the Middle East and the North Atlantic are currently prepared in WAFC London by means of an interactive computer workstation. Global coverage by three WAFS satellite broadcasts has been achieved, and very small aperture terminals (VSATs) are being installed in many States.

3.36 The implementation of volcanic ash advisory centres continued. Nine centres — Buenos Aires (Argentina), Darwin (Australia), Montreal (Canada), Toulouse (France), Tokyo (Japan), Wellington (New Zealand), London (United Kingdom), Anchorage and Washington (United States) — provide advisory information to area control centres and meteorological watch offices concerning the extent and trajectory of volcanic ash "clouds".

3.37 The implementation of tropical cyclone advisory centres (TCACs) also continued. All six centres, i.e. Darwin (Australia), Nadi (Fiji), La Réunion (France), New Delhi (India), Tokyo (Japan) and Miami (United States), covering the areas prone to tropical cyclones became operational.

Search and rescue

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

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

3.39 The system also continued to expand its capability. There were 5 satellites in operation, plus one in-orbit spare satellite; several replacement satellites incorporating technical enhancements were being built. The ground system of local user terminals (LUTs) and of mission control centres (MCCs) was improved and expanded. At year's end, 33 LUTs and 20 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. A geostationary component of the system was being developed which would provide for almost instantaneous alert.

3.40 Since it began trial operations in September 1982, the COSPAS-SARSAT system has contributed to the rescue of over 6 000 persons in aeronautical, maritime and terrestrial incidents.

Accident investigation and prevention

3.41 The number of passenger fatalities related to scheduled and non-scheduled operations increased in 1996 (see Chapter 4). In addition, there were a high number of casualties on the ground resulting from three major accidents in the vicinity of aerodromes. These fatality numbers underline the continuing need to improve accident prevention strategies and methods.

3.42 ICAO is closely monitoring and supporting recent incident reporting initiatives in the industry, such as the proposed "Global Analysis and Information Network" which may provide the tools required to direct future accident prevention efforts.

Controlled flight into terrain (CFIT)

3.43 In February, States were informed of the resolution adopted by the 31st Session of the Assembly (A31-9) which urged States to implement the ICAO programme for the prevention of CFIT, including the related ICAO provisions, in both international and domestic operations. The development of CFIT prevention material by the ICAO and Industry CFIT Task Force continued throughout the year. In October, the ICAO programme for the prevention of CFIT was approved for publication, to be achieved early in 1997.

Human Factors

3.44 The drive to incorporate Human Factors requirements into the certification process of equipment, procedures and personnel continued to gain momentum during 1996. ICAO has been involved in several fora where the subject was discussed. An industry consensus concerning practical implementation of these requirements in highly automated flight deck aircraft was achieved during 1996.

3.45 An initial review of the Annexes to the Convention to develop Human Factors-related SARPs was completed during 1996. The resulting amendment will be circulated to States and international organizations for comments during 1997.

Training

3.46 There is an increasing need to develop training in ICAO CNS/ATM systems. TRAINAIR members have begun to meet this need through the development of CNS/ATM-related Standardized Training Packages (STPs). The Airports Authority of India, Institute of Aviation Management, began preparation of the first TRAINAIR STP concerning CNS/ATM systems.

Substance abuse

3.47 As support for the guidance material contained in *the Manual on Prevention of Problematic Use of Substances in the Aviation Workplace* (Doc 9654), distributed to States in language versions in March, States and international organizations were consulted on a proposal to amend Annex 1 by adding a new provision relating to the use of psychoactive substances. Based on the responses received, the Air Navigation Commission will review the proposal in 1997.

Chapter 4
User and Public Interest

4.1 This chapter reviews the levels of safety and security in air transport in 1996, efforts during the year to improve compensation for passengers arising from aircraft accidents, 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 23 fatal aircraft accidents in 1996 involving 1 135 passenger fatalities compared to 26 fatal accidents and 710 passenger fatalities in 1995 (Table A1-3 in Appendix 1). Relating passenger fatalities to the volume of traffic, the rate of passenger fatality per 100 million passenger-kilometres increased from 0.03 to 0.05 in 1996 (Figure 4-1). The rate of fatal aircraft accidents per 100 million aircraft-kilometres flown decreased from 0.13 in 1995 to 0.11 in 1996 (Figure 4-2), and the rate of fatal aircraft accidents per 100 000 landings also decreased from the previous rate of 0.15 in 1995 to 0.13 in 1996 (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 in terms of passenger-kilometres performed, there were 11 accidents in 1996 with 1 017 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 5 per cent of the scheduled traffic volume, there were 12 accidents with 118 passenger fatalities. The fatality rate for turbo-jet aircraft operations was, therefore, far lower than for propeller-driven aircraft.

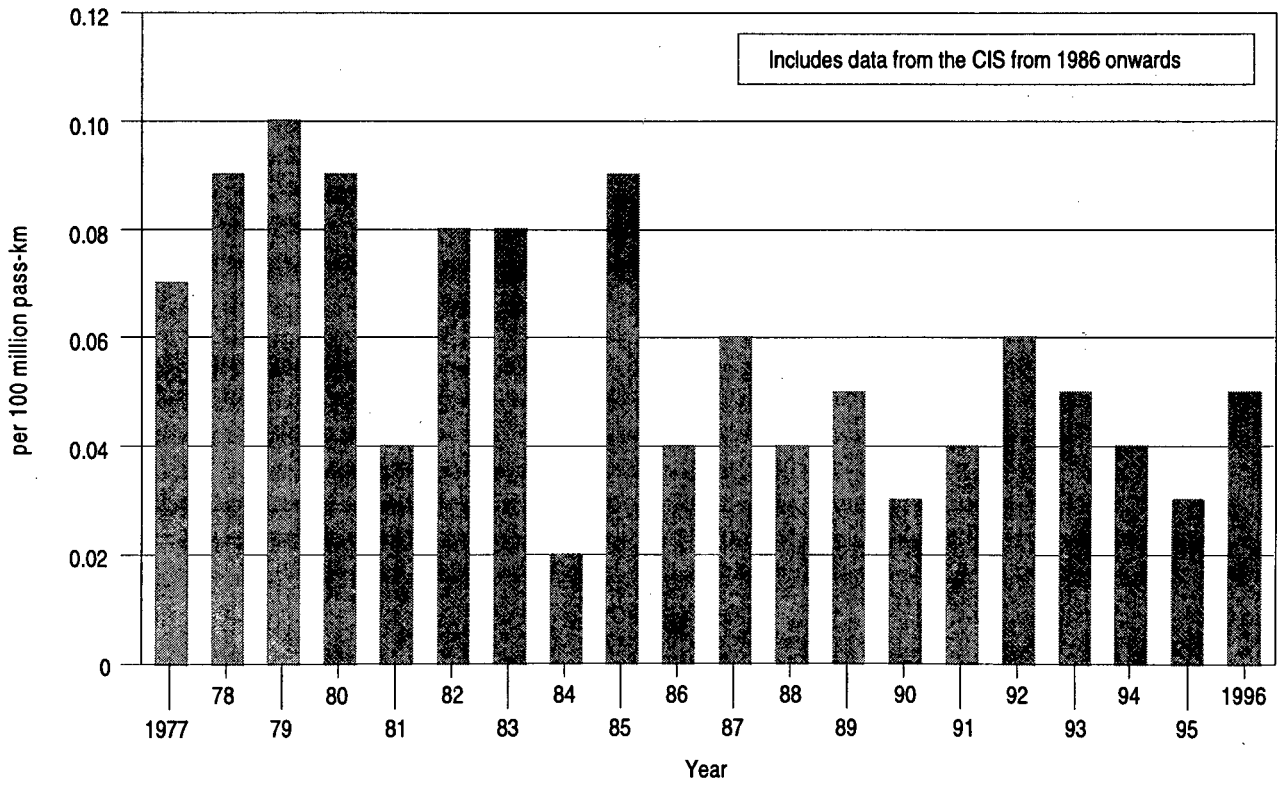
Non-scheduled commercial operations

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 1996 there were 25 fatal accidents with 479 passenger fatalities compared to 40 fatal accidents with 391 passenger fatalities in 1995.

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 4 fatal accidents with 342 passenger fatalities in 1996.

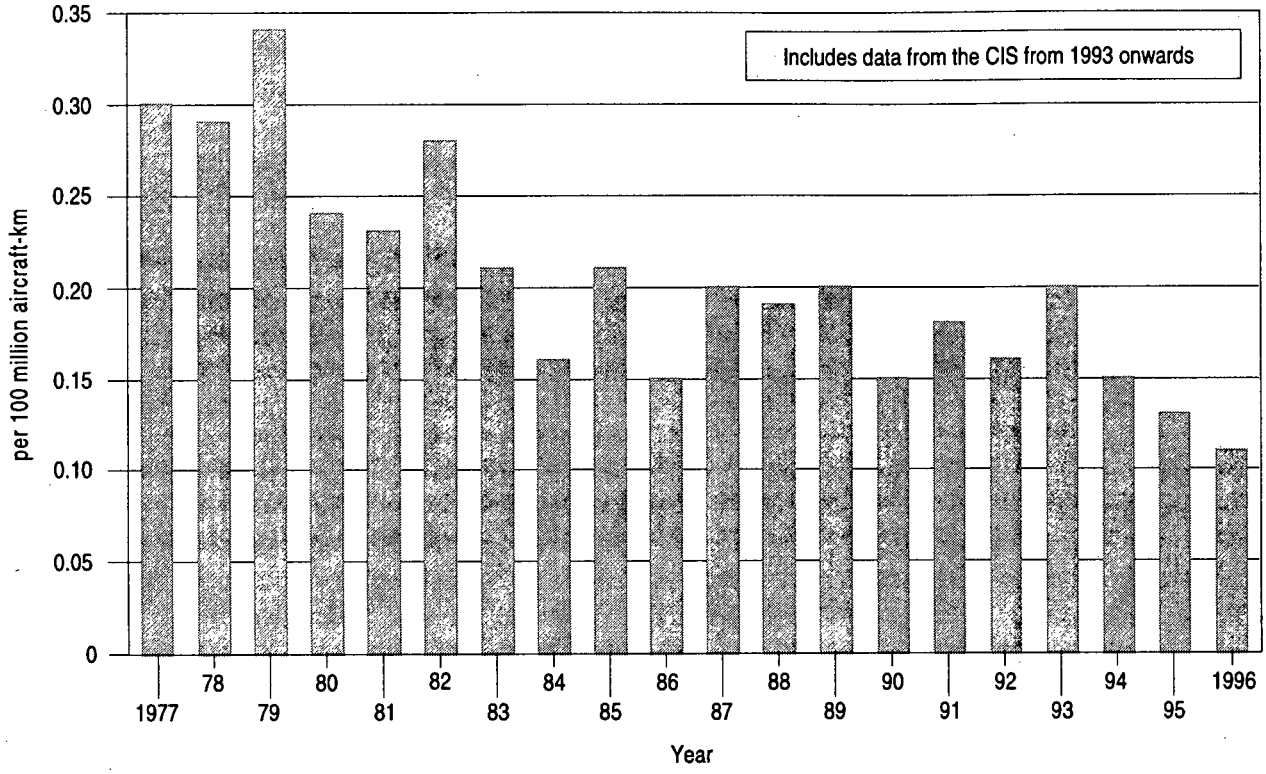
General aviation

4.6 Complete statistical information is not available on safety in general aviation operations. In 1995, it is estimated that general aviation aircraft were involved in about 780 fatal accidents and that the number of fatalities in these accidents was about 1 670 (data for 1996 were not available at time of writing). The number of fatal accidents per 100 000 aircraft hours flown was about 2.05 in 1995. In the United States, which accounts for about 60 per cent of all reported general aviation activities in the world, there were 358 fatal accidents in 1996 resulting in 631 fatalities, according to preliminary information. The corresponding numbers for 1995 were 408 fatal accidents and 733 fatalities. For the United States, the rate of fatal general aviation accidents per 100 000 aircraft hours flown was about 1.51 in 1996, compared to 2.04 in 1995.



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

Figure 4-1. Passenger fatalities per 100 million passenger-kilometres on scheduled services



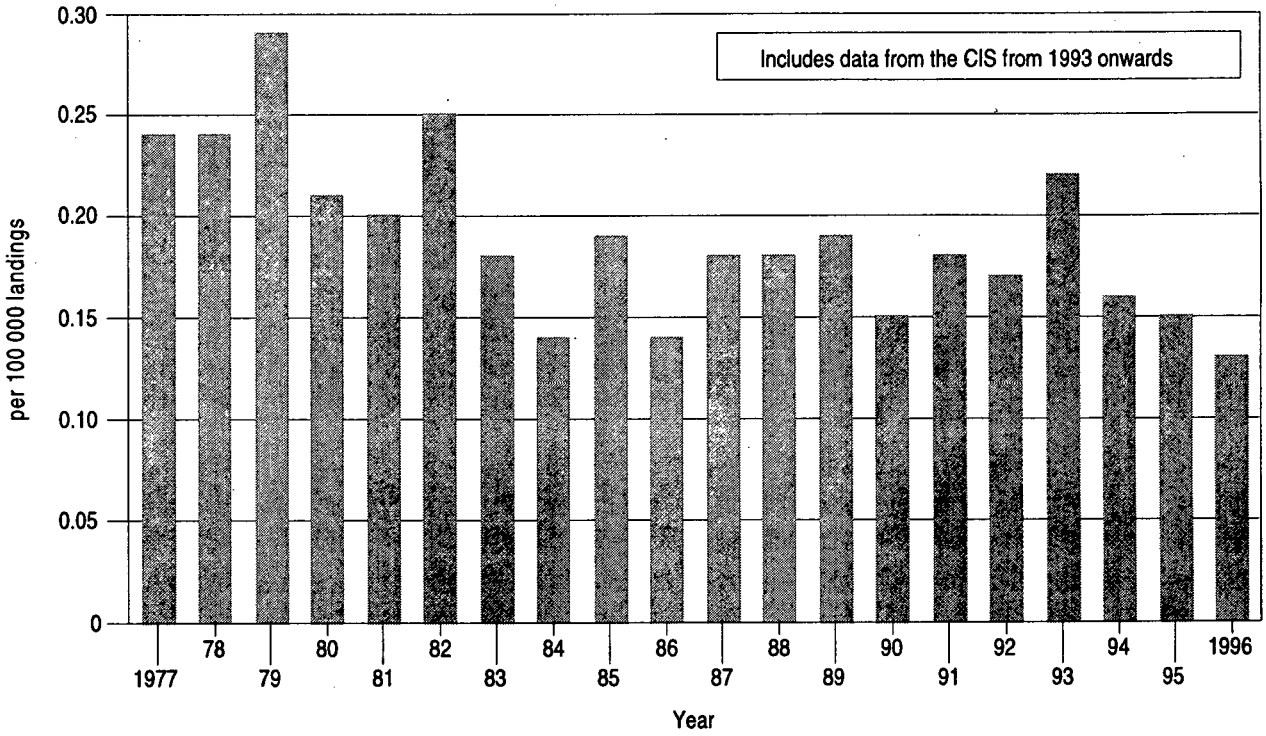
Source: ICAO Air Transport Reporting Form G and other reports.

Figure 4-2. Fatal accidents per 100 million aircraft-kilometres flown on scheduled services

Safety oversight

4.7 The ICAO Safety Oversight Programme, endorsed by the 31st Session of the Assembly, initiated its activities in March 1996. By the end of 1996, 56 States had requested a safety oversight assessment by an ICAO team. Thirty-two States' administrations were assessed during an eight-month period and it was expected that the 24 remaining States would be assessed during 1997. The assessed States have been requested to prepare actions plans to respond to the recommendations contained in the assessment reports in order to rectify deficiencies or to implement ICAO Standards and Recommended Practices with help, when necessary, provided through the ICAO Technical Co-operation Programme. Follow-up actions on the assessment reports were also planned for 1997 to be conducted by experts from ICAO Headquarters and the Regional Offices.

4.8 During 1996, the United States Federal Aviation Administration (FAA) continued to examine, under its International Aviation Safety Assessment Programme (IASAP), compliance



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

Figure 4-3. Fatal accidents per 100 000 landings by aircraft on scheduled services

with the ICAO safety standards by States whose carriers fly into the United States. As a result, three States were rated unsatisfactory (Category 3) which meant that carriers from those States were banned from flying into the United States; fifteen States were given a conditional (Category 2) rating, i.e. they would have to meet the necessary requirements within 6 months to a year; while five States were assessed to be satisfactory (Category 1), after three of them had been upgraded to this category. The prospect of one Latin American State being downgraded to the lowest category led to a brief interruption of air services between the United States and the former when this State retaliated by temporarily grounding two aircraft of a United States carrier as being unsafe. In 1996, the United States signed an air safety agreement with France. This was the third agreement of this kind following similar ones with the Kingdom of the Netherlands and the United Kingdom.

4.9 The European Union (EU) decided to join the United States in invoking its own aviation safety assessment rules by developing the Safety Assessment of Foreign Aircraft (SAFA) programme. The latter will assess the safety of individual non-EU carriers (predominantly through ramp spot checks) and the capability of the State of aircraft

registration to ensure long-term compliance with international safety standards. Implementation of this programme was entrusted to the European Civil Aviation Conference (ECAC) and the European Joint Aviation Authorities (JAA). The cornerstone of the SAFA system will be the ability to exchange information with the United States FAA on the results of checks and intelligence that might identify carriers or countries needing additional surveillance. Another of SAFA's main aims is the inclusion of a safety clause and the right to audit foreign carriers contracted by European tour operators in all bilateral air service agreements. Until the SAFA is backed by law, ECAC member States are urged to implement national regulations based on the draft SAFA rules. The United Kingdom, which earlier in the year had already strengthened foreign aircraft oversight, was one of the first States to respond. In 1996, the German civil aviation authorities banned a Turkish charter operator from landing in Germany after that operator failed to eliminate technical defects from its aircraft despite several warnings.

4.10 The Transport Ministers of the member States of the Asia-Pacific Economic Cooperation (APEC) Council established a Group of Experts on Aviation Safety to identify and provide advice on aviation safety problems in the Asia/Pacific region. The Group of Experts held its first meeting in April 1996 where it began the task of consolidating and prioritizing a list of safety issues that had been identified. The Group invited ICAO to participate as an observer and provide technical advice on its programme world-wide and in the region.

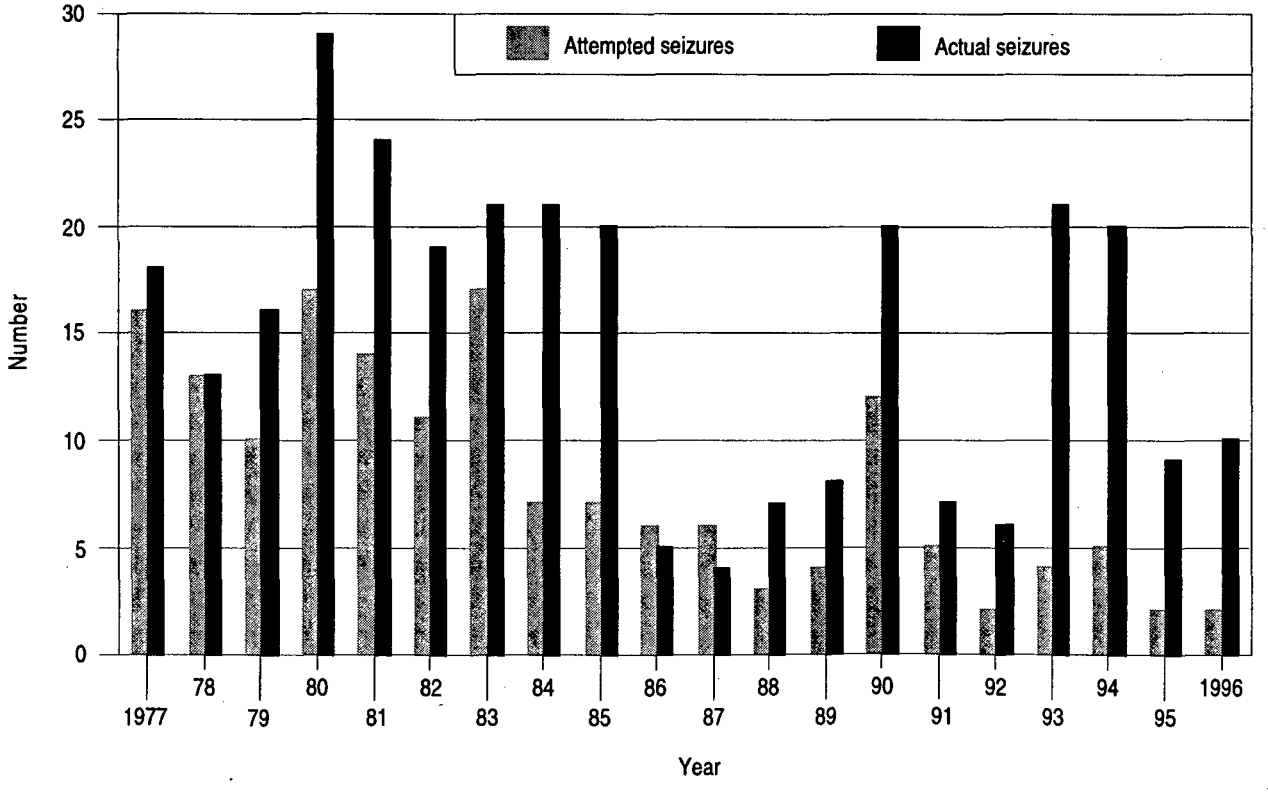


Figure 4-4. Acts of unlawful seizure

SECURITY

4.11 During 1996, there were 14 acts of unlawful interference officially reported or confirmed by concerned States, of which 10 were classified as unlawful seizures, 2 were attempted seizures, 1 was an attack on a ground facility and 1 was an unlawful act against the safety of civil aviation. Developments in acts of unlawful interference since 1977 are shown in Figures 4-4 to 4-6 and in Appendix 1, Table A1-4.

4.12 Amendment 9 to Annex 17 to the Convention on International Civil Aviation — *Security* — was adopted by the ICAO Council on 12 November 1996; it will become effective 31 March 1997 and applicable on 1 August 1997. This amendment includes the introduction of new provisions in relation to: pre-employment checks and capabilities of persons engaged in implementing security controls; baggage accountability and authorization; measures to be applied to catering supplies and operators' stores and supplies; tests for programme effectiveness; and the need for notification to the State of known or presumed destination of aircraft under a seized condition.

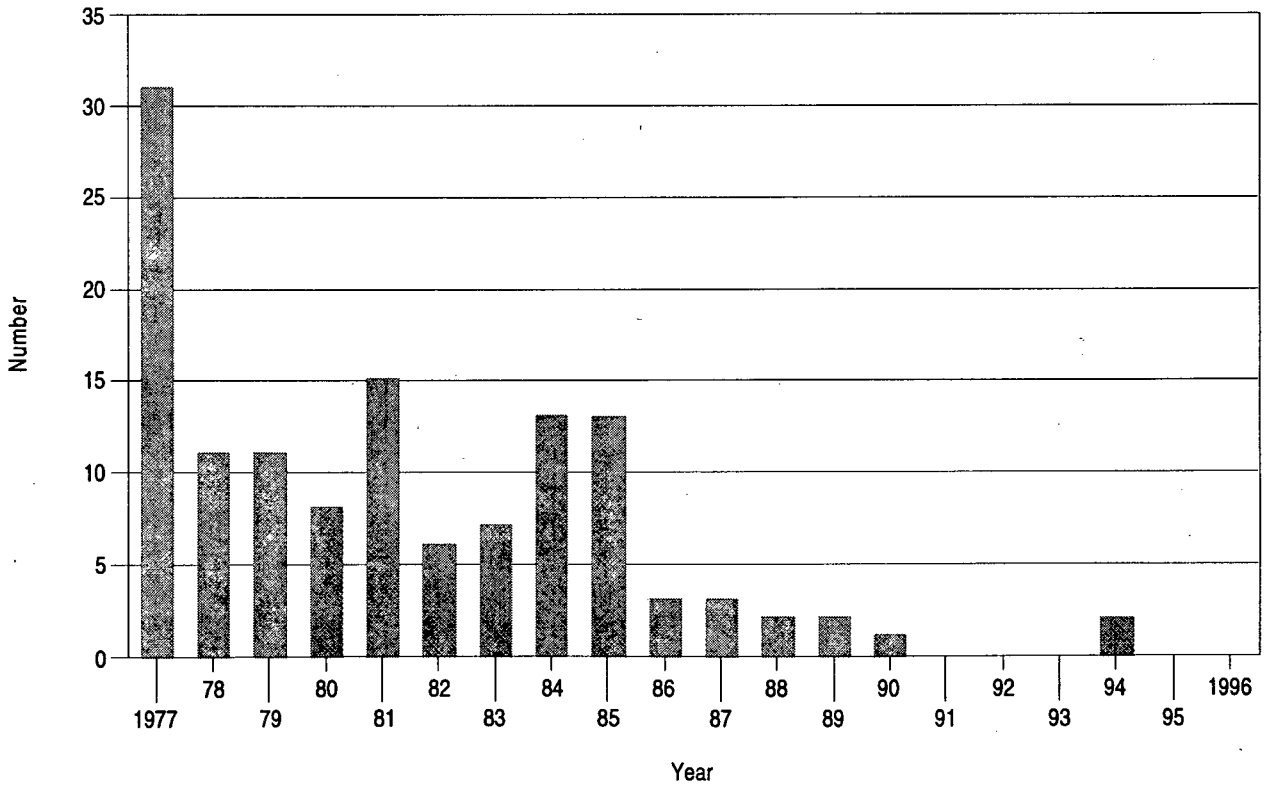


Figure 4-5. Incidents of sabotage

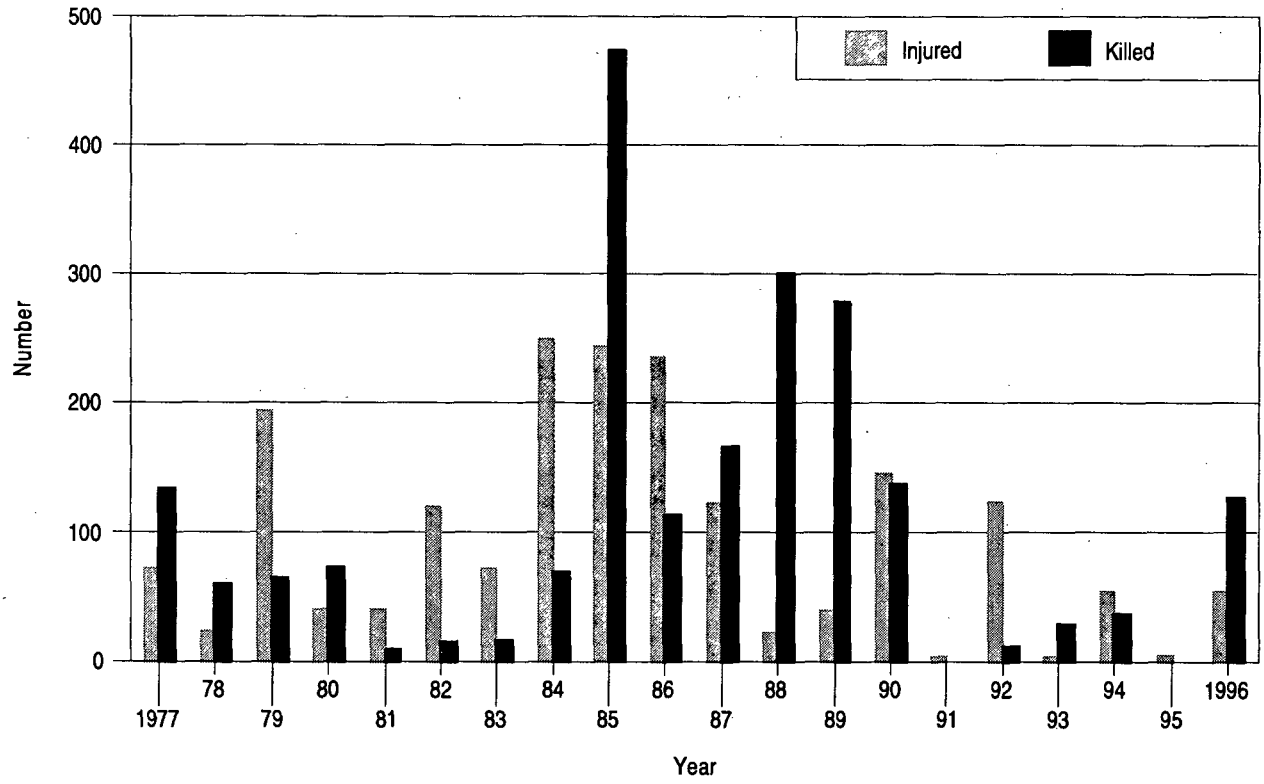


Figure 4-6. Number of persons killed or injured in acts of unlawful interference

4.13 In December 1996, the ICAO Council adopted technical criteria and specifications for an Explosive Detection System (EDS) and Explosive Device Detection System (EDDS) which will be of great assistance to manufacturers of security equipment.

4.14 During 1996 the problem of increasing levels of violence and verbal abuse from airline passengers attracted considerable attention in Asia and the Pacific, Europe and the United States. Air New Zealand reported it had on average two incidents on every long-haul sector. Cathay Pacific, which in 1996 had 251 incidents compared with 168 in 1995, prepared a handbook, *Guidelines for Handling Unruly Passengers*, and produced a training video for use by ground, flight and cabin crews and overseas stations. The United States FAA published an advisory circular providing guidance to airlines, law enforcement officers and the public on how to manage and reduce passenger interference with crew members. A number of carriers based in the United Kingdom received authorization to handcuff unruly passengers whose behaviour could threaten the safety of the flight.

AIR CARRIER LIABILITY

Compensation for passengers and shippers arising from aircraft accidents

4.15 The ICAO Study Group, established in November 1995 to assist in developing a mechanism to accelerate the modernization of the Warsaw System, met in February 1996 and a new draft instrument was subsequently developed.

4.16 The elements of the new draft Convention are contained in a single consolidated legal instrument representing a composite text that is meant to replace the current complex system of Conventions and Protocols. It retains the framework of the Warsaw Convention, while, at the same time, including some elements of the Hague Protocol of 1955. The draft instrument has fully incorporated the cargo provisions of Montreal Protocol No. 4 of 1975 and, where appropriate, has included provisions of Montreal Protocol No. 3 of 1975 and the Guatemala City Protocol of 1971.

4.17 Provisions of the ICAO draft on the issue of air carrier liability with regard to death or injury caused to passengers are similar to the principles of the Japanese initiative, where carriers have wide flexibility to waive any defences up to a specified monetary amount of recoverable compensatory damages (as circumstances may warrant). However, the ICAO draft has retained the status quo on liability principles regarding baggage and cargo, aligning documentary requirements to facilitate the flow of passengers, baggage and cargo and to obtain the benefits of new technology in the issuance of documents of carriage. Jurisdictional issues have been retained in the new ICAO document as they appear under the present regime, with the possibility of adding another jurisdiction, that of domicile of the passenger.

4.18 The new draft Convention was due to be considered by the ICAO Legal Committee in mid-1997.

Insurance

4.19 An Airclaims' estimate put 1996 hull losses at $812 million (compared with $740 million in the previous year), including $477 million for Western-built jet airliners (the rest covers losses of turboprops, helicopters, business aircraft and former USSR-built jet aircraft) with related passenger-liability claims at around $800 million — the worst since 1985. Between one-third and one-half of that loss is likely to come solely from the Trans World Airlines and ValuJet crashes in the United States.

4.20 However, during 1996, hull and liability insurance rates were reportedly down by an estimated 20-25 per cent. At the same time, airlines implementing a new regime under an IATA agreement for unlimited passenger liability faced additional premiums of between 20 and 25 per cent of the amount stipulated by already signed insurance contracts. Early estimates suggest that the full cost of ending the limits could run to an additional $100-300 million on world claims which have been averaging $400 million during the 1990s.

FACILITATION

4.21 The purpose of facilitation is to achieve maximum efficiency in landside operations for clearance of aircraft, passengers and cargo through necessary border formalities (immigration, customs, quarantine and public health), while maintaining high quality security and law enforcement. The strategy for pursuing the twin objectives of effective compliance and productivity includes the use of information technology and risk assessment techniques to improve inspection processes, and the development of industry/government co-operative arrangements to prevent problems such as illicit narcotics trafficking and illegal immigration.

4.22 ICAO has an active facilitation programme to support these aims. The main guidance document used by ICAO in this programme is Annex 9 to the Convention on International Civil Aviation, (Tenth Edition, April 1997). The latest edition of the Annex is the result of recommendations of the Eleventh Session of the Facilitation Division Meeting of ICAO which was held from 18-27 April 1995 under the theme "Implementation, co-operation and automation — keys to improved facilitation into the 21st century". The key word was automation whereby ICAO sought to use recent developments in electronic data interchange in its facilitation programme. Examples of this trend can be seen in ICAO's programme for the development of machine readable travel documents — machine readable passports and visas, identity cards used for travel and crew member certificates — and electronic data interchange in trade transactions of international air transport relating to the carriage of passengers and cargo.

ENVIRONMENTAL PROTECTION

4.23 In 1996, the aviation community continued to address the environmental problems associated with aircraft noise and aircraft engine emissions.

4.24 Concerning noise, the phasing out of operations 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) at noise-sensitive airports continued in a number of developed countries, in accordance with the policy framework established by the ICAO Assembly in 1990. States and airports are now considering what needs to be done in the longer term, once the phasing out of operations by Chapter 2 aircraft has been implemented.

4.25 In relation to aircraft engine emissions, the Intergovernmental Panel on Climate Change (IPCC) in its Second Assessment Report (1995) had underlined the continuing uncertainties regarding the impact of oxides of nitrogen (NO_x), water vapour and sulphur and the consequent need for further scientific research. In order to encourage this research and to provide proper expectations and guidance to policy-makers, a symposium on the atmospheric effects of aviation was held in April, hosted by the National Aeronautics and Space Administration (United States) and sponsored by ICAO and other international organizations. In September, the IPCC agreed to undertake a special report on *Aviation and the Global Atmosphere* in co-operation with the Ozone Scientific Assessment Panel under the Montreal Protocol and with ICAO involvement, for completion in early 1999.

4.26 Policy-making regarding engine emissions is currently hampered by continuing uncertainties regarding their impact and insufficient understanding of the trade-off between different types of emissions, for example carbon dioxide against NO_x. In June, ICAO consulted States and international organizations on a recommendation that the NO_x emission standards for new engines in Annex 16, Volume II, should be made more stringent. In December, the ICAO Council adopted a policy statement on environmental charges and taxes, in the form of a resolution. The Council reaffirmed that ICAO is seeking to identify a rational common basis on which States wishing to introduce environmental levies could do so and strongly recommended that any such levies should be in the form of charges rather than taxes. Meanwhile, Parties to the United Nations Framework Convention on Climate Change, which has the objective of stabilizing greenhouse gas concentrations in the atmosphere at safe levels, continued to work towards a 1997 deadline for strengthening developed country commitments. While that Convention has no specific provisions regarding civil aviation, some States would like to see measures to control aircraft engine emissions that contribute to climate change.

SMOKING RESTRICTIONS

4.27 Though the objective of ICAO Assembly Resolution A29-15 to achieve a complete smoking ban on all international flights by 1 July 1996 was not achieved, this Resolution served as a catalyst in the implementation of in-flight smoking restrictions. By the end of 1996, at least 6 States had implemented a complete smoking ban and a further 9 States were in the process of developing such legislation. In addition, a number of carriers had voluntarily introduced smoking bans in response to public demand.

4.28 In the United States, the Congressional hearing on a Bill introduced in February 1995 to prohibit smoking on all flights between the United States and foreign points continued; the International Airline Coalition on the Rule of Law (the same group of 13 European and Asia/Pacific airlines that opposed the United States ban on gambling — see Chapter 2) lobbied and publicly campaigned against this legislation on the grounds that a national law cannot be applied extra-territorially. All United States airline flight attendants who believed passive in-flight smoking made them ill were invited to participate in a lawsuit against tobacco companies. In Germany, a labour court ruled that flight attendants had no right to a smoke-free work environment and must serve smoking passengers, reversing earlier rulings which had supported the flight attendants' views.

4.29 By the end of 1996, about 15 airlines world-wide had implemented a complete smoking ban on all their international services. Another half-dozen airlines had banned smoking on about 90 per cent or more of their international flights, with services to and from Japan being the most common exception. In addition, more than 50 other carriers had implemented smoking bans on many of their international services. Most of these were on routes within Europe and across the North Atlantic. By mid-year, the United States Department of Transportation reported that 80 per cent of non-stop scheduled U.S. airline flights between the United States and foreign points were smoke-free.

THIS PAGE INTENTIONALLY LEFT BLANK

PART II

WORLD OUTLOOK TO 1999

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 5
Global Trends and Forecasts

5.1 This chapter reviews developments in the world economy over the period since 1985 and anticipated developments through to 1999; 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 1999.

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 1985 and 1995, the aggregate world economy measured in terms of Gross Domestic Product (GDP) grew at an average annual rate of 2.4 per cent in real terms. Growth rates varied across regions, from a high of 4.9 per cent for Asia/Pacific to a low of 0.1 per cent for Europe — including the CIS and eastern Europe (see Chapter 6 for further details). World population growth between 1985 and 1995 increased at an average annual rate of 1.7 per cent. Hence, growth of the world's GDP per capita between 1985 and 1995 increased at an average annual rate of 0.8 per cent, significantly lower than the growth of GDP itself, as indicated in Figure 5-1.

5.4 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" to developed market economies by the International Monetary Fund) went into serious decline. As a result, 1991 was the most difficult year for the global economy since 1982. Recovery commenced in North America in 1992, but it was not until 1994 that it took hold in most of western Europe and the Japanese economy remained weak until 1996.

5.5 Developing countries as a group (excluding the "countries-in-transition") have generally maintained an annual GDP 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 together with large capital inflows have

supported consistently strong growth in East and South East Asia. The economies of Latin America, Africa and the Middle East have all had significant periods of difficulty and low growth during the past decade.

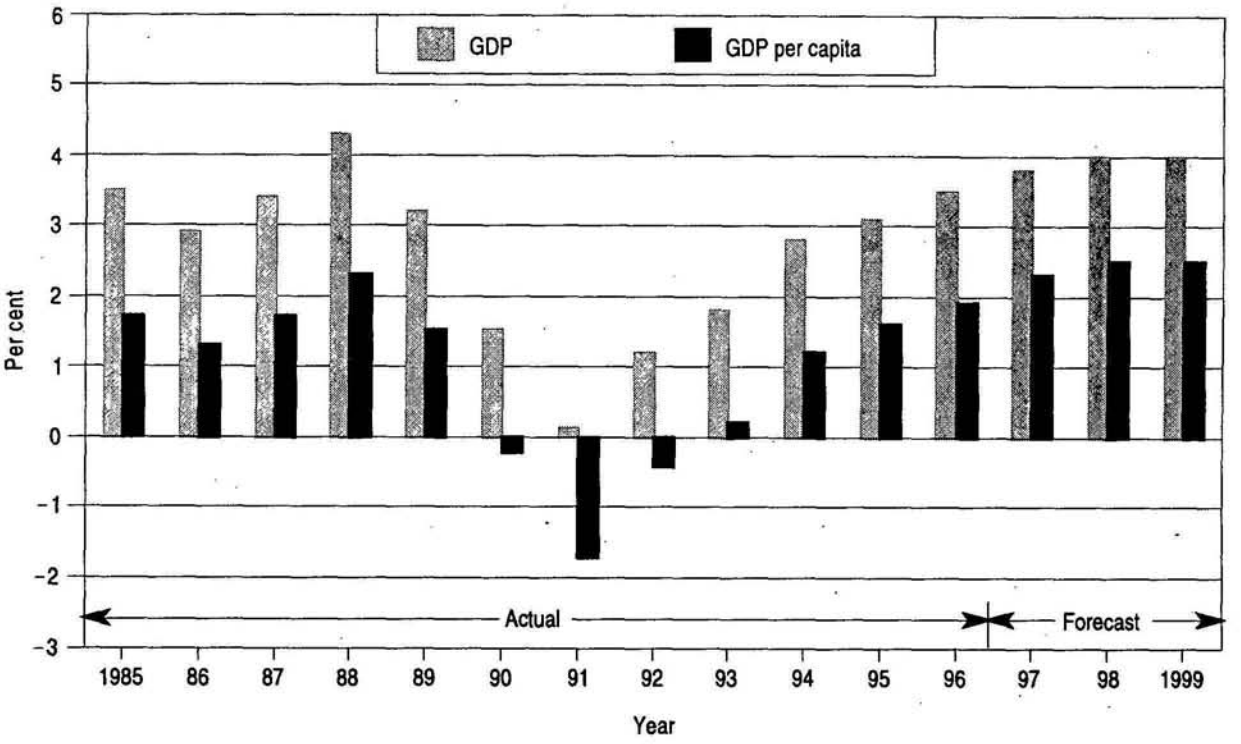
5.6 On several occasions in the last quarter century, sharp movements in crude oil prices have impacted powerfully on the world economy. In particular, the recessions of the mid-1970s and early 1980s were linked to the oil price increases of 1973 and 1979/80. Oil market conditions are therefore of great 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. However, in 1996 a significant and sustained increase in oil prices did occur which resulted in increased costs to air transport. By early 1997 oil prices had returned to pre-1996 levels.

5.7 Oil price rises and accommodating monetary policies contributed to double digit inflation in the industrial countries in the 1970s and early 1980s. Since 1983, average inflation in these countries has moderated to the 3 to 5 per cent range. Inflation rates have been high and variable in many developing countries and tended to increase over the 1980s. Inflation has been particularly serious in Latin America since 1987, and in the "countries-in-transition" in eastern Europe and the CIS since 1992, but after significant improvements in 1995, even further improvements were made in 1996.

5.8 There appears to be consensus among economic forecasters that the global economy will continue to expand over the medium term as recovery takes hold in Japan and conditions in the "countries-in-transition" improve. The assumptions for global and regional economic growth that have been used as a basis for air traffic forecasts over the period to 1999 are presented in Table 5-1. These assessments of the economic outlook take into account the most recent International Monetary Fund (IMF) and WEFA Group (formerly known as Wharton Econometrics Forecasting Associates) forecasts, as well as the views of other organizations, both government and private sector.

5.9 With the United States economy operating near to capacity, the moderate growth expected over the next three years must come from productivity improvement. After recent downturns in the French and German economies, improved growth is expected in 1997 and 1998. The commencement of recovery in the CIS and further growth in eastern Europe should make a positive contribution to the European economic outlook over the next few years.

5.10 Countries in the Asia/Pacific region are expected to continue to expand rapidly on the assumption that further trade liberalization and reforms in financial markets and other economic sectors will encourage exports, investment and growth in productivity. Furthermore, a growing Japanese economy will enhance the region's economy. Latin America is likely to experience progressive improvement over the next three years, with Mexico and Argentina recovering from the repercussions of the financial crisis in late 1994. The outlook for Africa and the Middle East is regarded with some optimism as a result of stronger macro-economic and structural policies in an increasing number of the countries in these regions.



Source: IMF, WEFA Group.

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

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

Region	Actual 1995	Estimated 1996	Forecast 1997	Forecast 1998	Forecast 1999
Africa	2.9	5.0	4.7	4.8	4.9
Asia/Pacific	5.0	5.6	5.0	5.4	5.3
Europe	2.0	1.4	2.5	3.2	3.4
Middle East	3.8	4.5	3.9	3.9	3.9
North America	2.0	2.3	3.0	2.3	2.3
Latin America and Caribbean	1.3	3.5	4.4	5.1	4.7
World	3.1	3.5	3.8	4.0	4.0

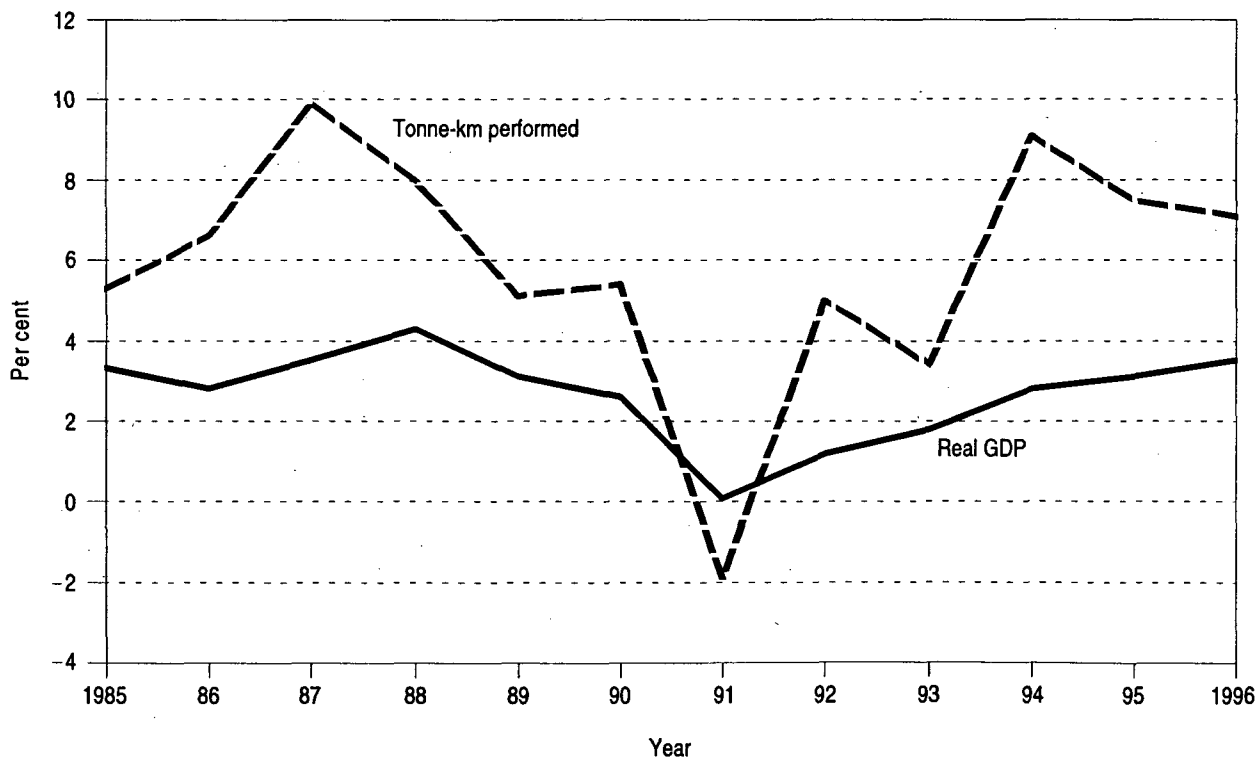
Source: ICAO estimates based on World Bank, International Monetary Fund (IMF), WEFA Group and other economic sources.

AIRLINE TRAFFIC TRENDS

5.11 Total scheduled airline traffic, measured in terms of total tonne-kilometres performed, grew at an average annual rate of 5.9 per cent between 1985 and 1996. Passenger-kilometres grew at an average rate of 5.3 per cent per annum and freight tonne-kilometres at nearly 7.6 per cent per annum.

5.12 Global traffic data for each year of the decade 1985-1996 are given in Tables 5-2 (total traffic) and 5-3 (international traffic).

5.13 In broad terms, the pattern of traffic growth over the 1985-1996 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. 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 dramatic than had



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

Figure 5-2. World GDP and scheduled traffic growth

Table 5-2. World total international and domestic revenue traffic
(scheduled services of airlines of ICAO Contracting States, 1985-1996)

Year	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1985	899	6.0	1 367 350	7.0	13.7	2.2	39 840	0.4	4 400	2.1	167 690	5.3
1986	960	6.8	1 452 060	6.2	14.7	7.3	43 190	8.4	4 550	3.4	178 800	6.6
1987	1 028	7.1	1 589 470	9.5	16.1	9.5	48 320	11.9	4 700	3.3	196 470	9.9
1988	1 082	5.3	1 705 430	7.3	17.2	6.8	53 270	10.2	4 830	2.8	212 110	8.0
1989	1 109	2.5	1 773 700	4.0	18.1	5.2	57 150	7.3	5 060	4.8	223 000	5.1
1990	1 165	5.0	1 894 250	6.8	18.4	1.7	58 800	2.9	5 330	5.3	235 220	5.5
1991	1 135	-2.6	1 843 920	-2.7	17.4	-5.4	58 530	-0.5	5 090	-4.5	230 570	-2.0
1992	1 146	1.0	1 930 140	4.7	17.6	1.1	62 650	7.0	5 130	0.8	242 250	5.1
1993	1 142	-0.3	1 948 680	1.0	18.0	2.3	68 440	9.2	5 230	1.9	250 590	3.4
1994	1 234	8.1	2 100 520	7.8	20.2	12.2	77 210	12.8	5 410	3.4	273 480	9.1
1995	1 302	5.5	2 251 170	7.2	21.8	7.9	83 120	7.7	5 640	4.3	293 920	7.5
1996	1 380	6.0	2 411 010	7.1	23.0	5.5	88 810	6.8	5 890	4.4	314 680	7.1

Source: ICAO Air Transport Reporting Form A-1.

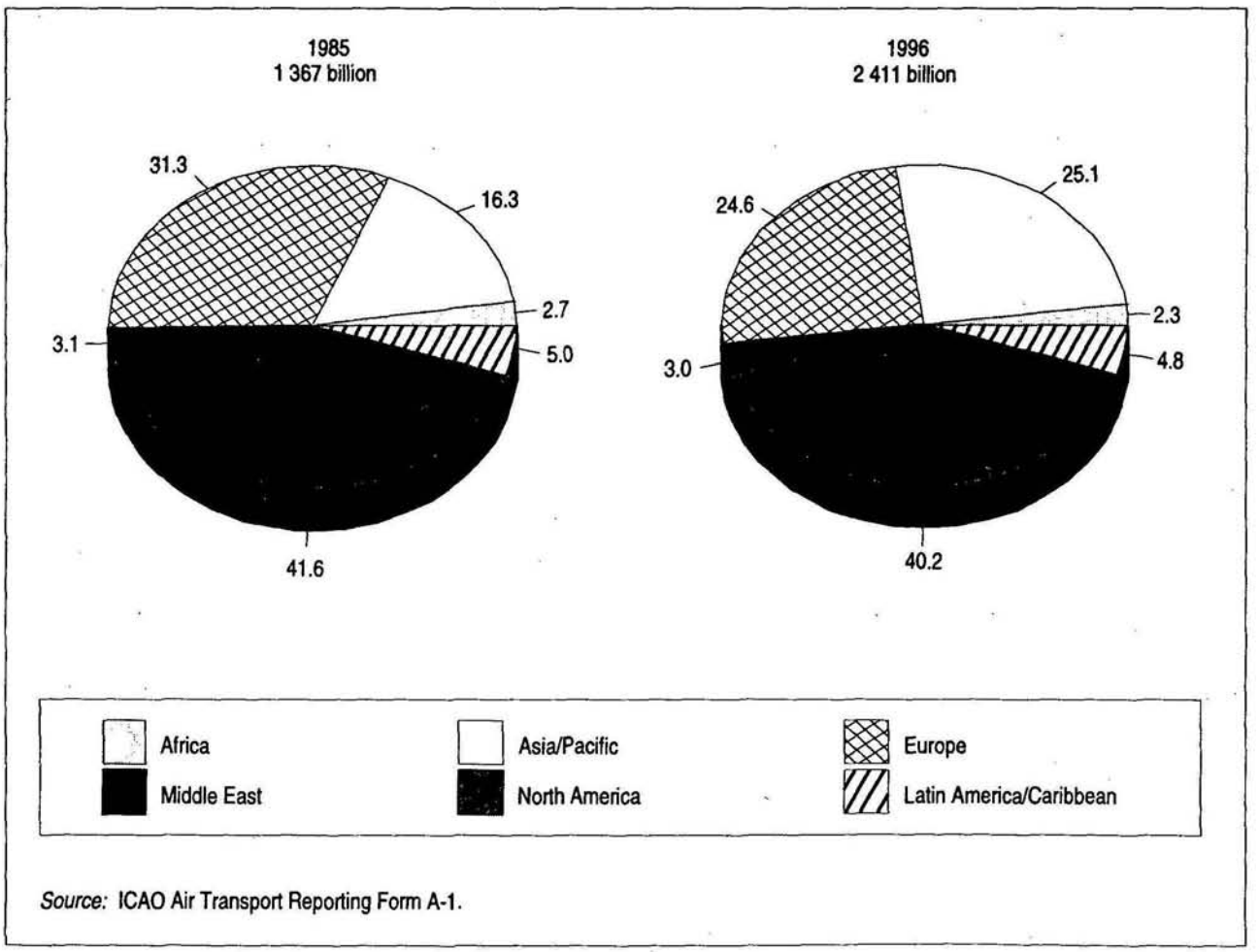
Table 5-3. World international revenue traffic
(scheduled services of airlines of ICAO Contracting States, 1985-1996)

Year	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1985	194	4.9	590 190	6.2	5.9	1.7	29 380	1.5	1 860	1.1	85 600	4.6
1986	198	2.1	603 140	2.2	6.4	8.5	32 230	9.7	1 890	1.6	89 710	4.8
1987	222	12.1	687 580	14.0	7.2	12.5	36 690	13.9	1 950	3.2	101 980	13.7
1988	243	9.5	760 990	10.7	7.8	8.3	41 020	11.8	1 990	2.1	113 180	11.0
1989	262	7.8	823 760	8.2	8.6	10.3	44 940	9.6	2 080	4.5	123 020	8.7
1990	280	6.9	893 500	8.5	8.6	0.0	46 320	3.1	2 190	5.3	130 730	6.3
1991	267	4.6	859 750	-3.8	8.5	-1.2	46 380	0.1	2 210	0.9	128 120	-2.0
1992	299	12.0	982 540	14.3	9.3	9.4	50 750	9.4	2 200	-0.5	143 600	12.1
1993	319	6.7	1 046 880	6.5	10.3	10.8	56 040	10.4	2 200	0.0	155 440	8.2
1994	347	8.8	1 143 740	9.3	11.8	14.6	64 700	15.5	2 240	1.8	173 140	11.4
1995	375	8.1	1 252 870	9.5	13.0	10.2	70 320	8.7	2 400	7.1	189 480	9.4
1996	409	9.1	1 363 350	8.8	13.7	5.4	75 200	6.9	2 550	6.3	204 870	8.1

Source: ICAO Air Transport Reporting Form A-1.

been the case in 1992. On the other hand, economic growth began to provide a more solid foundation for traffic growth. These trends continued in 1996, resulting in an estimated growth for total scheduled passenger traffic of 7.1 per cent for the year.

5.14 The regional distribution of scheduled passenger traffic for the years 1985 and 1996 is illustrated in Figure 5-3. The airlines of the North American and European regions dominate, contributing 72.9 per cent of the total traffic in 1985 and 64.8 per cent in 1996. Passenger traffic performed by airlines registered in the Asia/Pacific region increased from 16.3 per cent of the total world traffic in 1985 to about 25.1 per cent in 1996. Other regions contributed 10.8 per cent of the traffic in 1985 and 10.1 per cent in 1996.

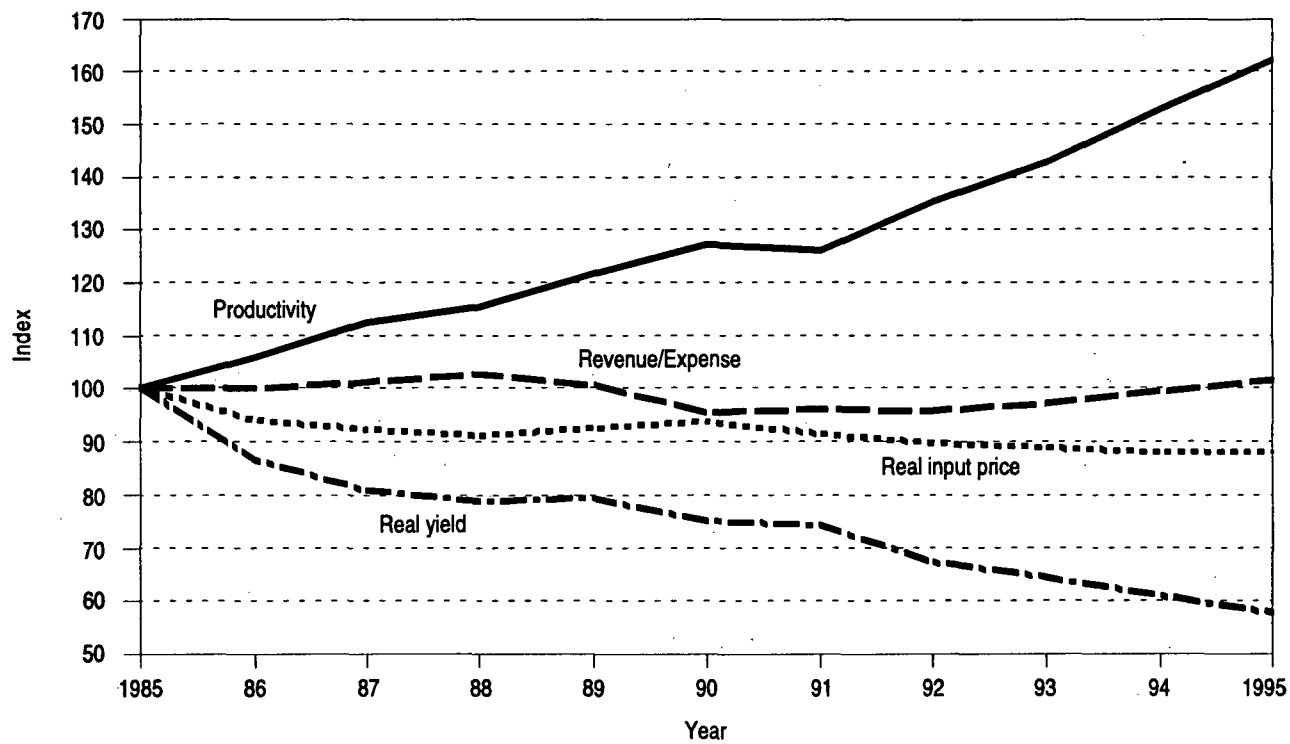


Source: ICAO Air Transport Reporting Form A-1.

Figure 5-3. Regional distribution of scheduled passenger traffic — percentage of passenger-kilometres performed

AIRLINE PRODUCTIVITY, PRICES AND FINANCIAL PERFORMANCE

5.15 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 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 1985 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.



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

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

5.16 Improvements in productivity can, in principle, be used either to reduce the real fares and rates paid by passengers and shippers, 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 (revenue per tonne-kilometre performed) 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 benefited 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).

5.17 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 since 1985 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 and by 1995 the industry delivered an operating surplus of $13.5 billion and obtained a positive net result of about $4.5 billion. According to preliminary estimates for 1996, a reduced operating surplus of about $12.0 billion was achieved. The smaller operating profit in 1996 reflects cost pressures, notably from higher aviation fuel prices, a higher value of the United States dollar in relation to other world currencies and a levelling out in the average load factor despite the strong traffic growth.

5.18 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 6.0 per cent to 8.5 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 benefited from productivity improvements and reductions in fuel prices.

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		Net result[3]		Direct subsidies U.S.$ (millions)	Income taxes U.S.$ (millions)
			Amount U.S.$ (millions)	Percentage of operating revenues	Amount U.S.$ (millions)	Percentage of operating revenues		
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	230	-1 150
1987	147 000	139 800	7 200	4.9	2 500	1.7	290	-1 670
1988	166 200	156 000	10 200	6.1	5 000	3.0	320	-3 340
1989	177 800	170 200	7 600	4.3	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	140	1 040
1993	226 000	223 700	2 300	1.0	-4 400	-1.9	150	-270
1994	244 700	237 000	7 700	3.1	-200	-0.1	70	-1 300
1995	267 000	253 500	13 500	5.1	4 500	1.7	110	-2 170
1996[4]	281 500	269 500	12 000	4.3				

1. Revenues and expenses are estimated for non-reporting airlines.
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 operating results — net results not yet available.

Source: ICAO Air Transport Reporting Form EF-1.

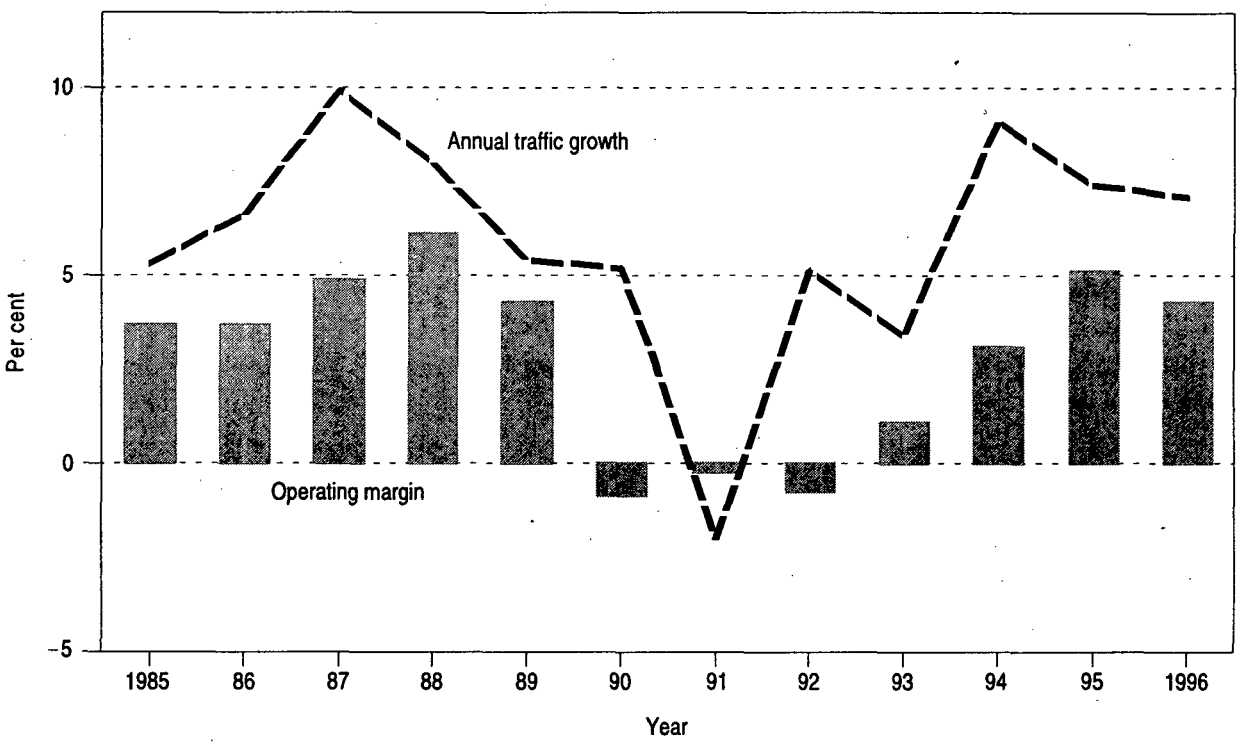
5.19 The variations in the annual operating result, measured as a percentage of airline revenue, are illustrated graphically for the period 1985-1996 in Figure 5-5, which also shows the fluctuations in traffic growth over the same period. There is a positive correlation between this measure of financial 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 increased progressively, resulting in successive improvements in financial performance. Financial performance continued to improve in 1995 but was hampered slightly in 1996 by the increase in fuel prices.

Table 5-5. Distribution of operating revenues and expenses in 1985 and 1995
(scheduled airlines of ICAO Contracting States[1], total domestic and international services)

Description	Distribution by item (per cent) 1985	1995	Change in per cent share of item 1985 to 1995
OPERATING REVENUES			
Scheduled services (total)	90.9	87.5	-3.4
Passenger	77.5	76.8	-0.7
Freight	11.9	9.7	-2.2
Mail	1.5	1.0	-0.5
Non-scheduled operations	3.1	4.0	0.9
Incidental	6.0	8.5	2.5
TOTAL	100.0	100.0	—
OPERATING EXPENSES			
Direct aircraft			
Flight operations (total)	32.3	26.3	-6.0
Flight crew	6.7	7.7	1.0
Fuel and oil	22.0	11.4	-10.6
Other	3.6	7.2	3.6
Maintenance and overhaul	10.2	10.6	0.4
Depreciation and amortization	7.2	7.3	0.1
Sub-total	49.7	44.2	-5.5
Indirect			
User charges and station expenses (total)	16.0	18.2	2.2
Landing and associated airport charges	3.3	4.5	1.2
En-route facility charges	1.5	2.8	1.3
Station expenses	11.2	10.9	-0.3
Passenger services	9.6	11.0	1.4
Ticketing, sales, promotion	17.1	15.6	-1.5
General, administrative and other	7.6	11.0	3.4
Sub-total	50.3	55.8	5.5
TOTAL	100.0	100.0	—

1. Excludes operations within the Commonwealth of Independent States.

Source: ICAO Air Transport Reporting Form EF-1.



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

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

5.20 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 the early 1990s were accompanied by introductory costs and higher depreciation expenses, 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.

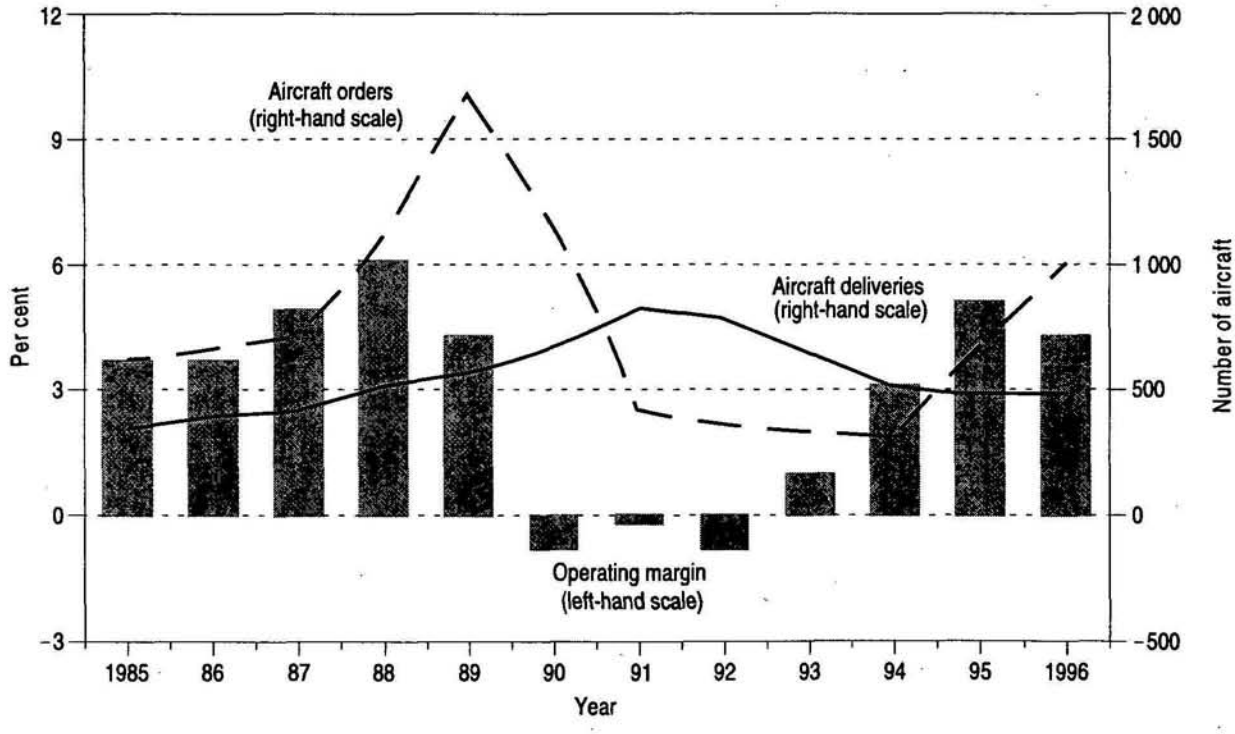
5.21 The high rates of aircraft deliveries in the early 1990s resulted from very high volumes of aircraft orders in earlier years, which were generated by strong traffic growth and a ready availability of finance. Because of the lag between orders and deliveries, the buoyant market conditions which existed 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 after 1990, aircraft deliveries returned to moderate levels in 1994 and 1995. Together with improved demand, this helped to reduce excess capacity in the industry. In 1995 and 1996 aircraft orders started to increase again, surpassing aircraft deliveries for the first time since 1990.

AIRLINE PASSENGER TRAFFIC FORECAST

5.22 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 1997, 1998 and 1999 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.

5.23 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.

5.24 The economic forecasts, which were introduced at the beginning of this chapter, are based on assumptions about broad business cycle conditions and developments, fiscal and



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

Figure 5-6. Financial return and aircraft supply

monetary policy settings and the international trade and financial environment. Assumptions related to population growth and productivity improvement which affect aggregate economic output over the longer term are also taken into consideration. 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.

5.25 The prospects for airline yields are closely related to cost developments and market conditions in the airline industry. Productivity improvement in the airline industry should continue to produce cost savings, thereby providing some potential for real reductions in air fares. 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 with the exception of 1996, fuel price volatility has been short term, with limited impact on year-average price levels and airline yields. Salaries and wages represent the largest airline expense item. Labour cost pressures could build up gradually over the next few years with consequences for airline yields. These various cost pressures will provide a benchmark for airline yields, with revenues needing to be sufficient to cover costs over the long term. However, in the short term, movements in yields will be influenced by competitive conditions in airline markets.

5.26 The global and regional scheduled passenger traffic forecasts for 1997, 1998 and 1999, 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. Global passenger traffic is expected to grow by 6.2 per cent in 1997, which is below the actual 1996 growth rate of 7.1 per cent (which was aided significantly by unexpectedly strong growth by North American carriers). Continued economic growth should boost traffic by around 6.4 per cent in 1998 and 6.6 per cent in 1999. 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.

5.27 Traffic growth will vary by geographic region because of the impact of specific local or regional factors. The developing regions of the Middle East, Africa and Latin America and the Caribbean are expected to experience relatively high rates of passenger traffic growth over the forecast period, reflecting the expectations of rapid economic growth. However, Asia/Pacific traffic is still expected to grow at the highest rate. European aviation markets are also forecast to be reasonably buoyant, with some further benefits of liberalization and recovery in eastern Europe and the CIS. More moderate growth is expected in the mature North American markets despite the strong performance in 1996. Further details of the trends and forecasts on a region-by-region basis may be found in Chapter 6.

AIRLINE FINANCIAL FORECAST

5.28 Financial trends in the airline industry are difficult to forecast because airlines are able to adjust capacity over time and manage yields through fare adjustments at relatively short notice to respond to (or to create) changes in demand. In addition, fluctuations in the value of the United States dollar complicate the interpretation and forecasting of global

Table 5-6. ICAO scheduled passenger traffic forecast for 1997-1999
(passenger-kilometres performed)

Region of airline registration	ACTUAL 1985 (billions)	ACTUAL 1995 (billions)	Average annual growth (%)	ESTIMATED 1996 (billions)	Growth (%)	FORECAST 1997 (billions)	Growth (%)	1998 (billions)	Growth (%)	1999 (billions)	Growth (%)
Africa	36.7	50.8	3.3	55.4	9.1	59.6	7.5	63.7	7.0	68.1	6.9
Asia/Pacific	222.3	559.5	9.7	606.0	8.3	657.5	8.5	720.6	9.6	794.1	10.2
Europe (incl. CIS)	428.2	564.5	2.8	591.8	4.8	626.8	5.9	667.9	6.5	712.0	6.6
Middle East	42.7	66.9	4.6	72.0	7.6	76.9	6.8	81.9	6.5	87.4	6.7
North America	569.2	900.6	4.7	970.1	7.7	1 015.7	4.7	1 057.3	4.1	1 101.7	4.2
Latin America/ Caribbean	68.3	108.8	4.8	115.7	6.3	123.8	7.0	131.8	6.5	140.2	6.3
World	1 367.4	2 251.1	5.1	2 411.0	7.1	2 560.3	6.2	2 723.3	6.4	2 903.6	6.6

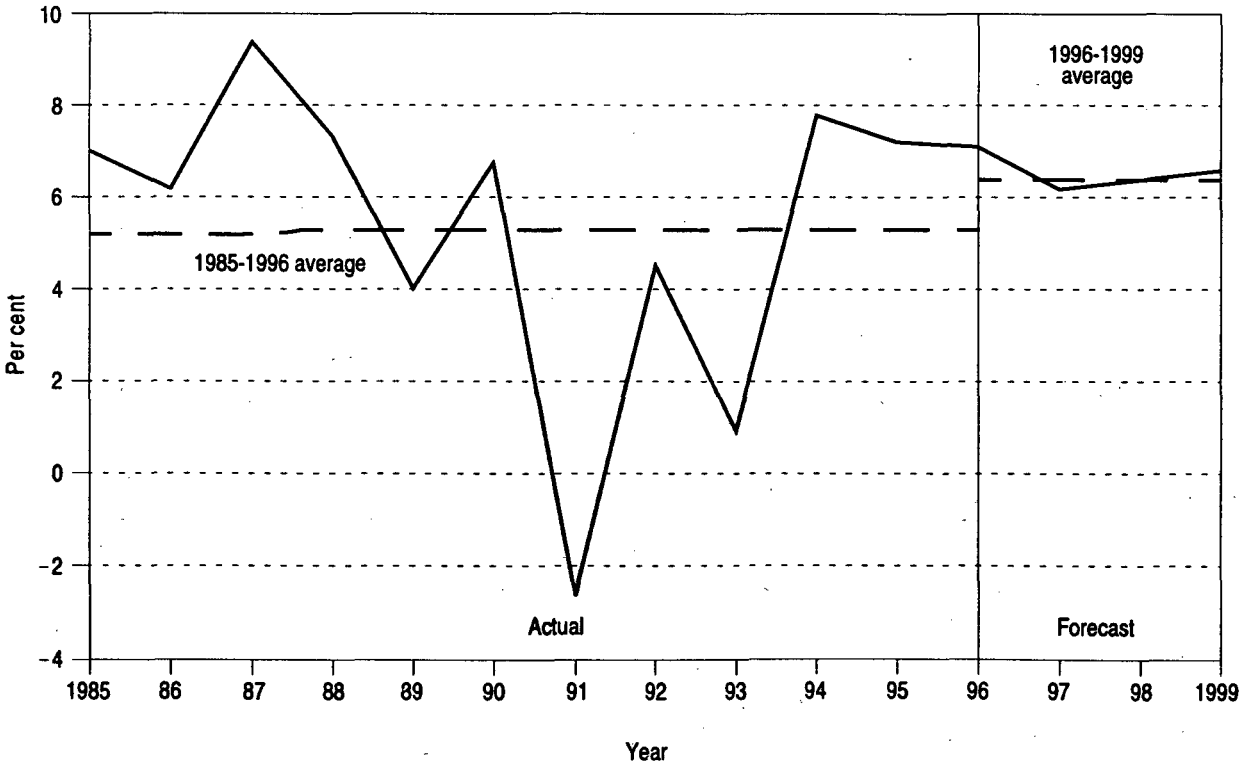


Figure 5-7. World scheduled passenger traffic growth — passenger-kilometres performed

financial results which are presented in U.S. dollar terms. Also, 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. Because of these considerations, the forecasts are restricted to indicative global trends in financial results (excluding operations within the Commonwealth of Independent States, for which no historic data are available).

5.29 The forecast for total revenues for scheduled airlines is based on assumptions for passenger yields and on the passenger forecasts presented above, together with further assumptions for 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 in current U.S. dollars of about 8.3 per cent in 1997, 8.5 per cent in 1998 and 8.7 per cent in 1999. These compare with an average rate of 8.5 per cent per annum over the past ten years.

5.30 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. Airlines are taking steps to trim employment levels and generally improve productivity in order to contain costs. However, wage pressures could increase as labour markets tighten in some regions over the next few years. As a result of these considerations, airline expenses in current U.S. dollars are expected to grow at rates of about 8.2 per cent in 1997, 8.7 per cent in 1998 and 8.7 per cent in 1999 (compared to an average rate of 8.4 per cent per annum over the past ten years).

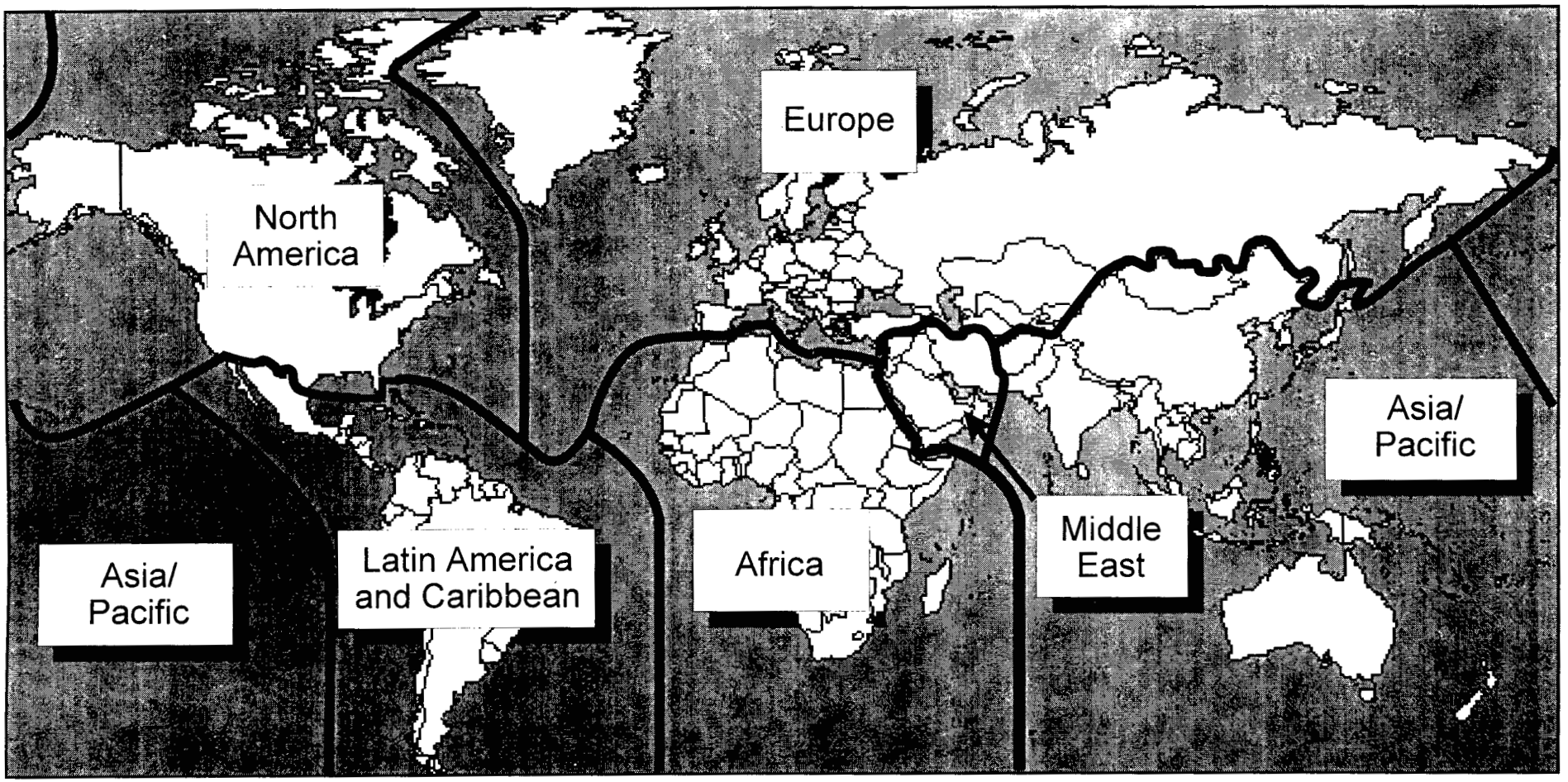
5.31 The operating result for the world's scheduled airlines is the difference between operating revenues and expenses, the forecasts of which have here been made independently and which are both subject to significant margins of error. It is therefore not possible to forecast the operating result with any reasonable degree of certainty. Nevertheless, the above forecasts of operating revenues and expenses imply that the operating result as a percentage of operating revenues will remain fairly consistent at just over 4 per cent in each of the forecast years. These estimates suggest a stable outlook for the global airline industry in line with expectations for traffic growth and general economic development.

THIS PAGE INTENTIONALLY LEFT BLANK

PART III

REGIONAL PERSPECTIVES, 1996 TO 1999

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 1996, the economic environment over the period since 1985 and anticipated through to 1999, and airline finances and passenger traffic trends over the period since 1985, and presents scheduled passenger traffic forecasts for the airlines of each region through to 1999. 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 and the Caribbean.

AFRICA

The Region in 1996

Table 6-1. Scheduled traffic — airlines of Africa

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	14 750	7.0	3.6	28 820	6.0	2.1
Passenger-kilometres performed (millions)	45 770	9.3	3.4	55 430	9.1	2.3
Freight and mail tonne-kms performed (millions)	1 420	5.3	1.8	1 530	5.6	1.6

Source: ICAO Air Transport Reporting Form A-1.

6.2 The airline industry in the region, with the exception of a very few carriers, has not yet reached the maturity expected of it to play its role as a catalyst for national economic development and integration. The industry faces both internal and external challenges.

Among these challenges are the continued fragmentation of the African market; the consequent undeveloped route network; scarce funds for re-equipment; institutional, managerial and financial instability of African airlines; and the need for greater inter-airline co-operation.

6.3 On the positive side, the restructuring and commercialization, started in 1992, are beginning to produce some positive results. The gradual loosening of the attachment to the notion of "flag" carrier which no longer appears to be a priority for a number of African governments, coupled with governments' "hands off" policy, has started to contribute to the development of the aviation industry in Africa as shown by the successful restructuring and privatization of Kenya Airways. More airlines are being prepared for restructuring and are beginning to show positive results. The turnaround at Air Tanzania and Uganda Airlines are examples to be cited. However, the process is very slow.

6.4 The measures of gradual liberalization of the air transport regulatory policies and inter-airline co-operation continued to be debated both in regional groupings such as the African Civil Aviation Commission (AFCAC) and in sub-regional groupings such as in the Southern African Development Community (SADC) and the East African Cooperation.

Economic trends

6.5 Over the 1985-1995 period, the aggregate African economy (GDP) grew at an average annual rate of 1.8 per cent in real terms, although GDP per capita fell at 1.1 per cent. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-1.

6.6 Economic conditions in the region have been adversely affected by the external environment, with slow growth in export markets and declining terms of trade, and States in the region have faced difficulties in foreign debt servicing. However, economic performance has improved recently, as mentioned in Chapter 1. The real growth of GDP for 1996 is estimated to have been around 5.0 per cent.

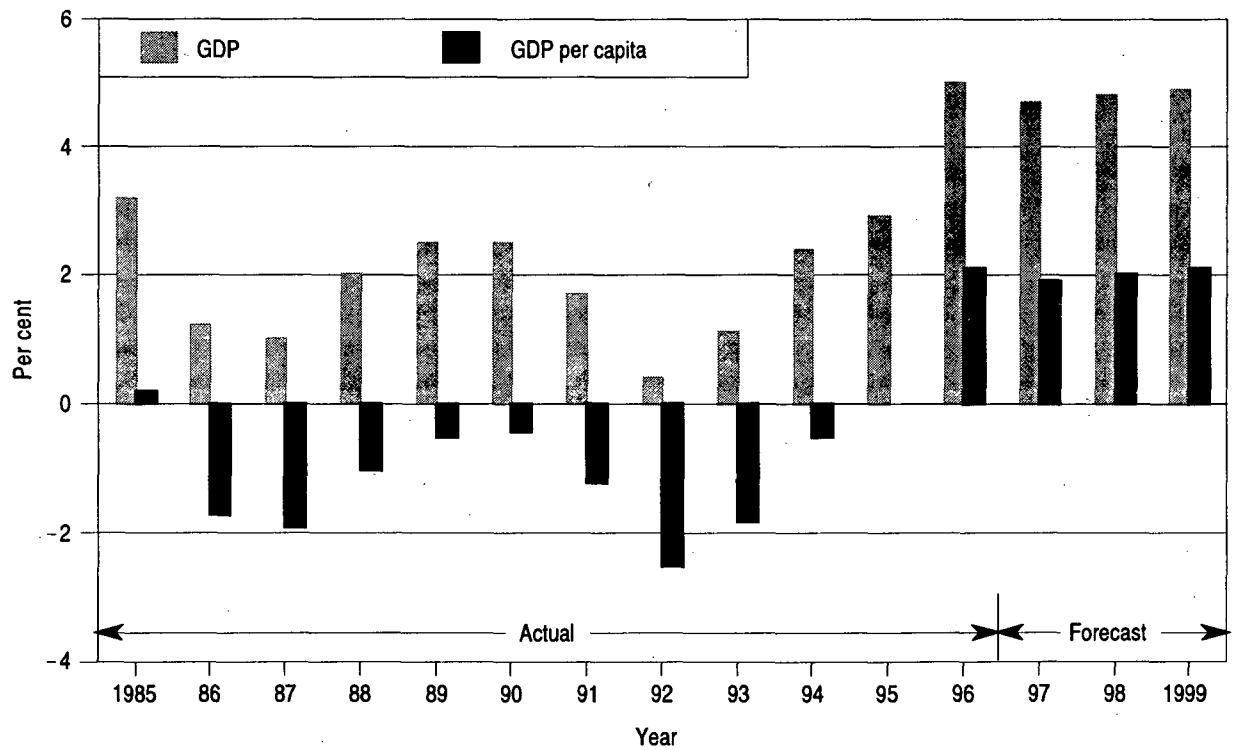
6.7 Over the next three years, economic growth in Africa is expected to further improve as the policy environment is strengthened and the global economy expands. However, there are a number of countries where conditions remain difficult. Also prospects are dependent on developments in commodity prices (e.g. coffee, oil, various minerals). The economy of the African region is projected to increase at 4.7, 4.8 and 4.9 per cent for the years 1997, 1998 and 1999, respectively.

Airline financial trends

6.8 Over the 1985-1995 period, operating revenues (in U.S. dollars) of the scheduled airlines of the African region increased at an average annual rate of 5.4 per cent (compared

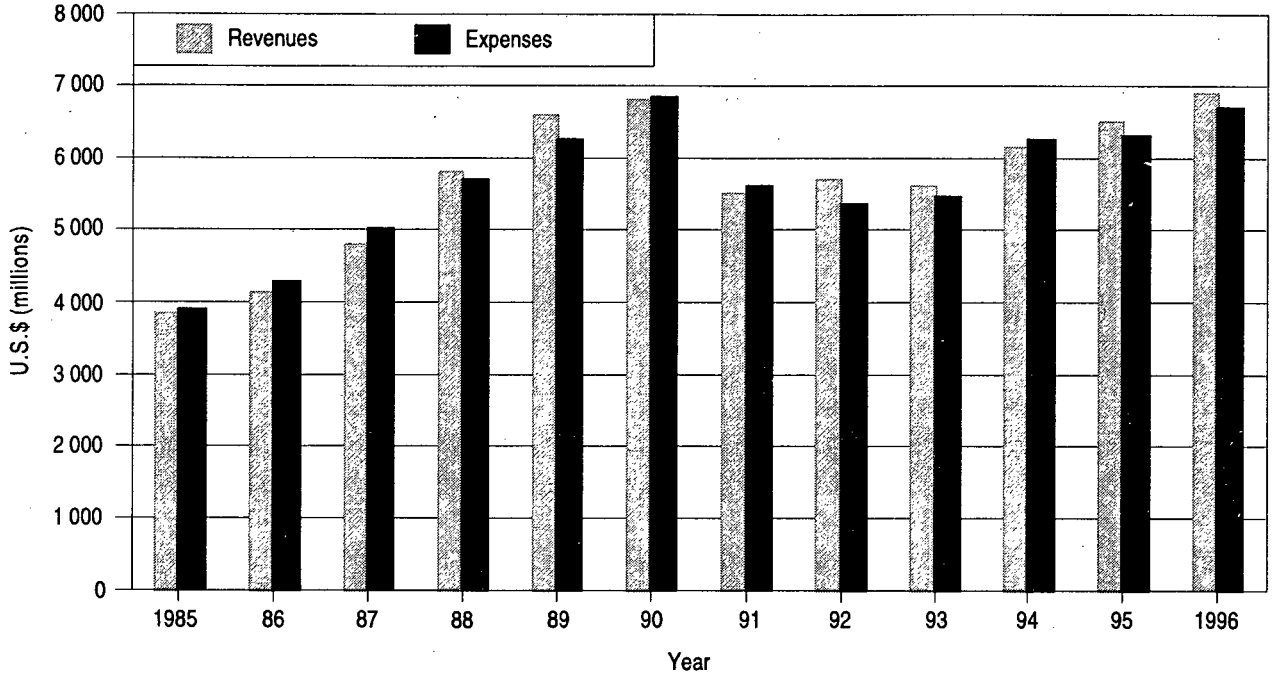
to the world annual average of 9.1 per cent). Operating expenses for the same period increased by 4.9 per cent per annum. These rates reflect the relatively low traffic growth experienced over most of the period, but also the efforts by the African industry to improve efficiency and financial performance. Positive over-all operating results have been achieved since 1992 as illustrated in Figure 6-2.

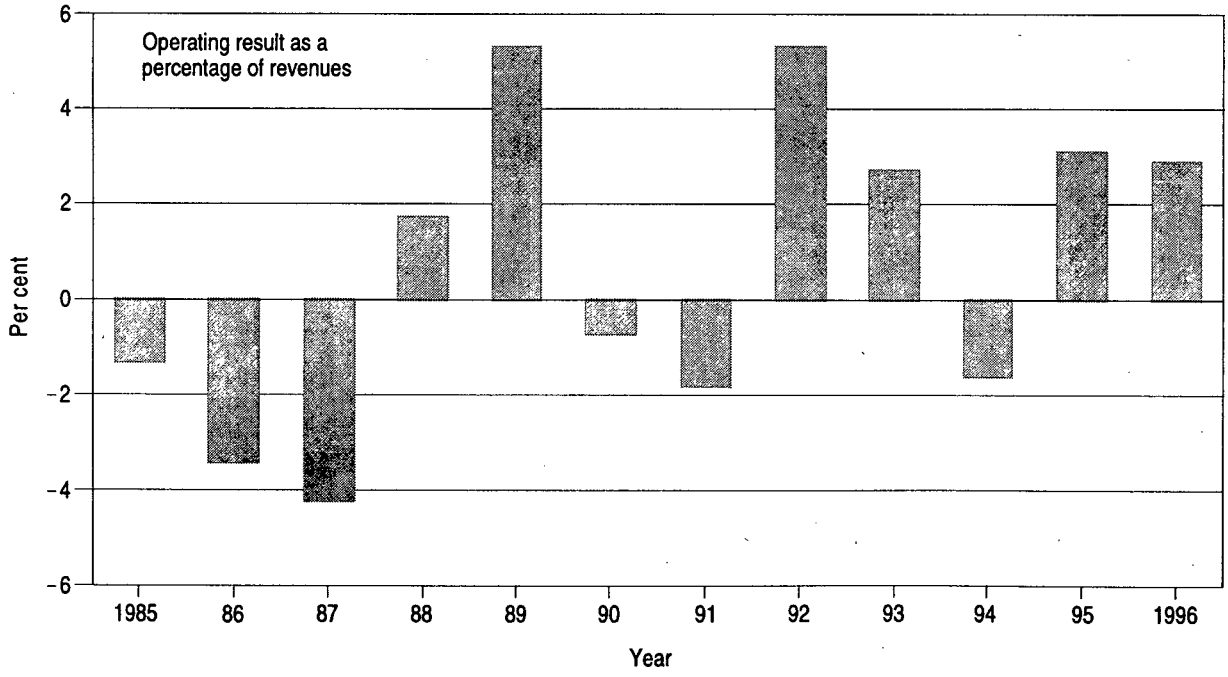
6.9 For the 1985-1995 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometre performed (PKP), declined at an average annual rate of 2.6 per cent in real terms (compared to a 0.9 per cent decline for the world). The year-to-year comparisons 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.



Source: IMF, WEFA Group.

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





Note.— 1996 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

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

Notes: — *1996 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

Airline passenger traffic trends and forecast

6.10 Over the 1985-1995 period, scheduled passenger traffic (PKP) of airlines of the African region increased at an average annual rate of 3.3 per cent (compared to the world annual average of 5.1 per cent). An increase in traffic of over 7 per cent was recorded in 1995 followed by an estimated 9.1 per cent growth in 1996. The year-to-year traffic growth comparison between world and African airlines is shown in Figure 6-4.

6.11 As shown in Table 5-6 and illustrated in Figure 6-4, scheduled passenger traffic of the airlines of the African region is forecast to increase by 7.5, 7.0 and 6.9 per cent for the years 1997, 1998 and 1999, respectively, compared to world airline growth of 6.2, 6.4 and 6.6 per cent. The expectations for improved growth for African airlines are based primarily on an improved economic outlook.

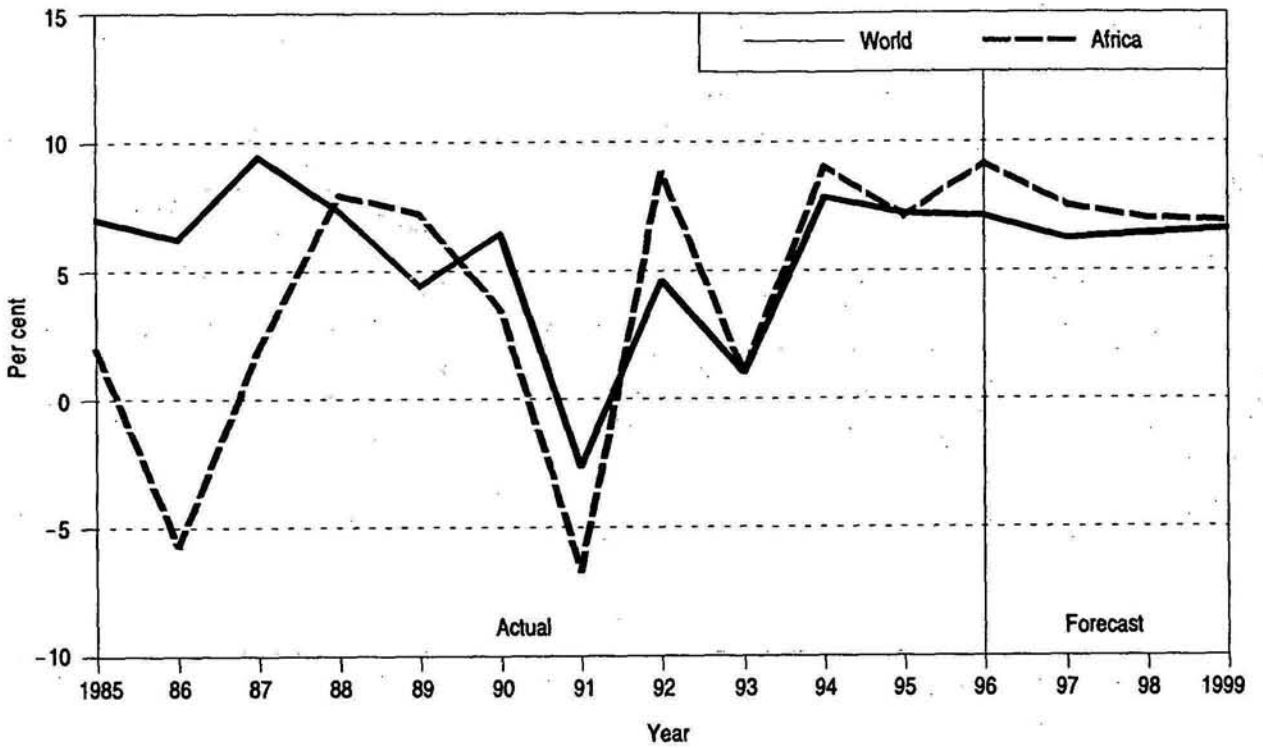


Figure 6-4. Scheduled passenger traffic growth (PKPs) — Africa and World

ASIA/PACIFIC

The Region in 1996

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

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	103 710	9.9	25.4	329 740	5.7	23.9
Passenger-kilometres performed (millions)	417 040	9.9	30.6	605 970	8.3	25.1
Freight and mail tonne-kms performed (millions)	29 030	7.7	37.4	31 620	7.7	33.4

Source: ICAO Air Transport Reporting Form A-1.

6.12 The Annual Conference of Directors General of Civil Aviation, Asia/Pacific region, has assumed a higher profile and has become more action-oriented. It has started developing "Action items" which the Directors General and/or ICAO are required to act upon, to keep the others informed on progress during the course of the year, and to provide the results at the subsequent Conference.

6.13 Australia and New Zealand signed an arrangement for a Single Aviation Market which came into effect on 1 November 1996. Under this arrangement, the airlines of each country gained unrestricted rights to fly anywhere within the other country and on trans-Tasman routes.

6.14 The Asia-Pacific Economic Cooperation (APEC) Council established a small group of experts to develop an options paper for more competitive air services within the area concerned. The resulting paper identified eight areas where APEC economies could facilitate more competitive air services, including more flexible airline ownership and control arrangements; general easing of tariff regulations; adequacy of existing air-cargo service; facilitation of co-operative arrangements, such as codesharing, joint-operations and inter-lining; and a more open market access. The paper will be considered by APEC Transport ministers in 1997.

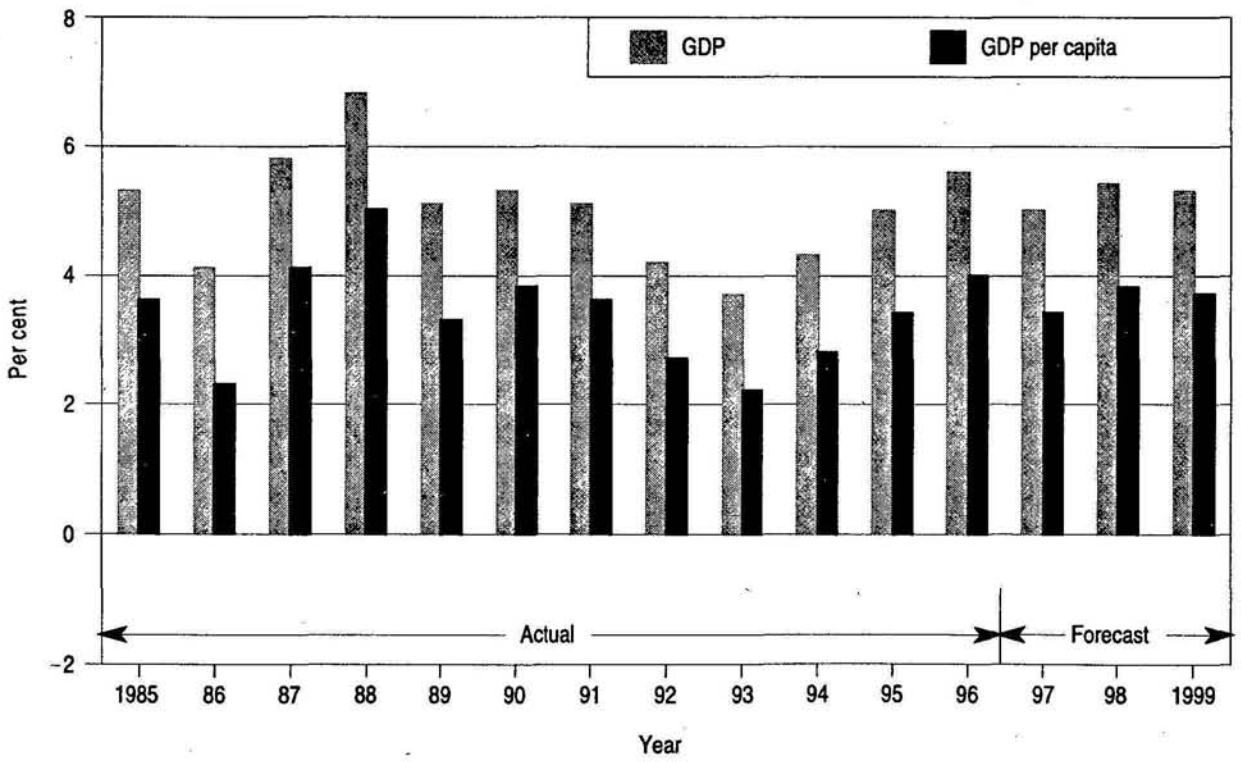
6.15 An informal meeting, the Regional Co-operation Forum for International Air Transport in Asia and Oceania, was convened in Kyoto, Japan in January/February to exchange views on air transport regulatory policy. Invitation to the meeting was extended to eighteen Asia/Pacific States. The primary objective of the meeting was to provide a forum for exchanging views on the follow-up of matters arising from the ICAO World-wide Air Transport Conference, Montreal, November/December 1994. The Forum decided to convene a second meeting in Thailand in 1997.

6.16 Discussions continued in various fora in 1996 on possibilities to liberalize air services, and several bilateral air services agreements during the year included more liberal arrangements particularly for air freight traffic. Discussions also commenced on possible "open-sky" agreements.

Economic trends

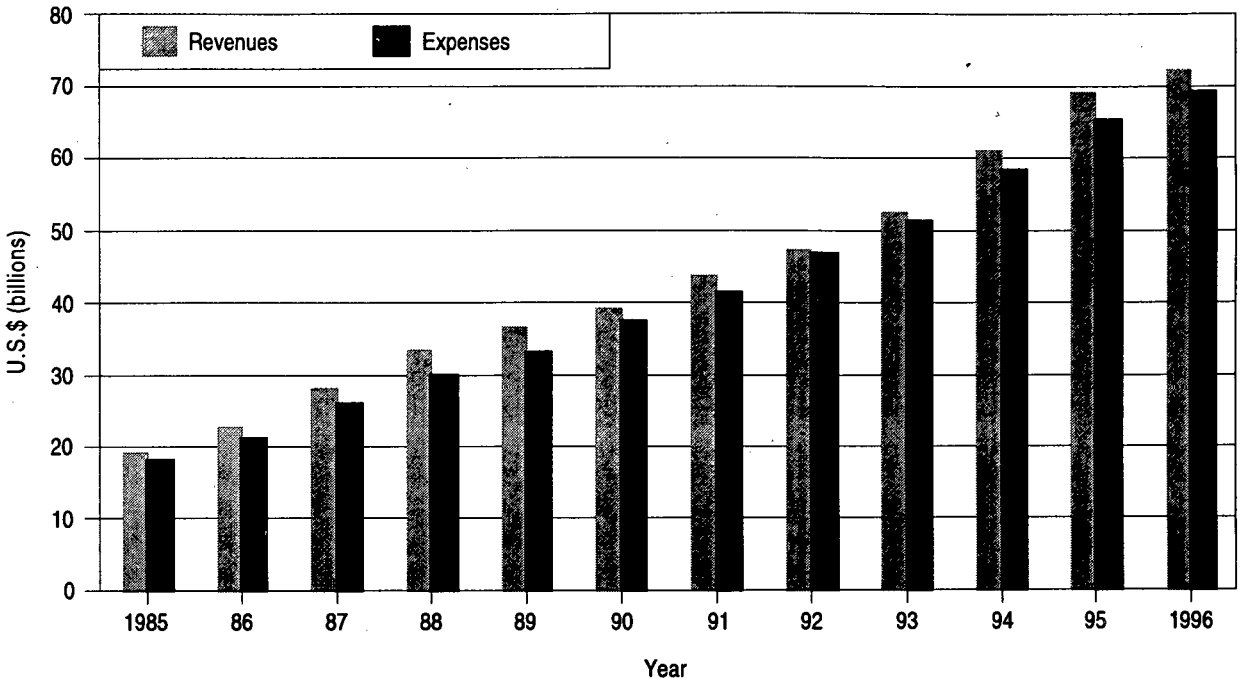
6.17 Over the 1985-1995 period, the aggregate Asia/Pacific economy (GDP) grew at an average annual rate of 4.9 per cent in real terms, and GDP per capita increased at 3.3 per cent, the highest growth rates of all ICAO regions. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-5.

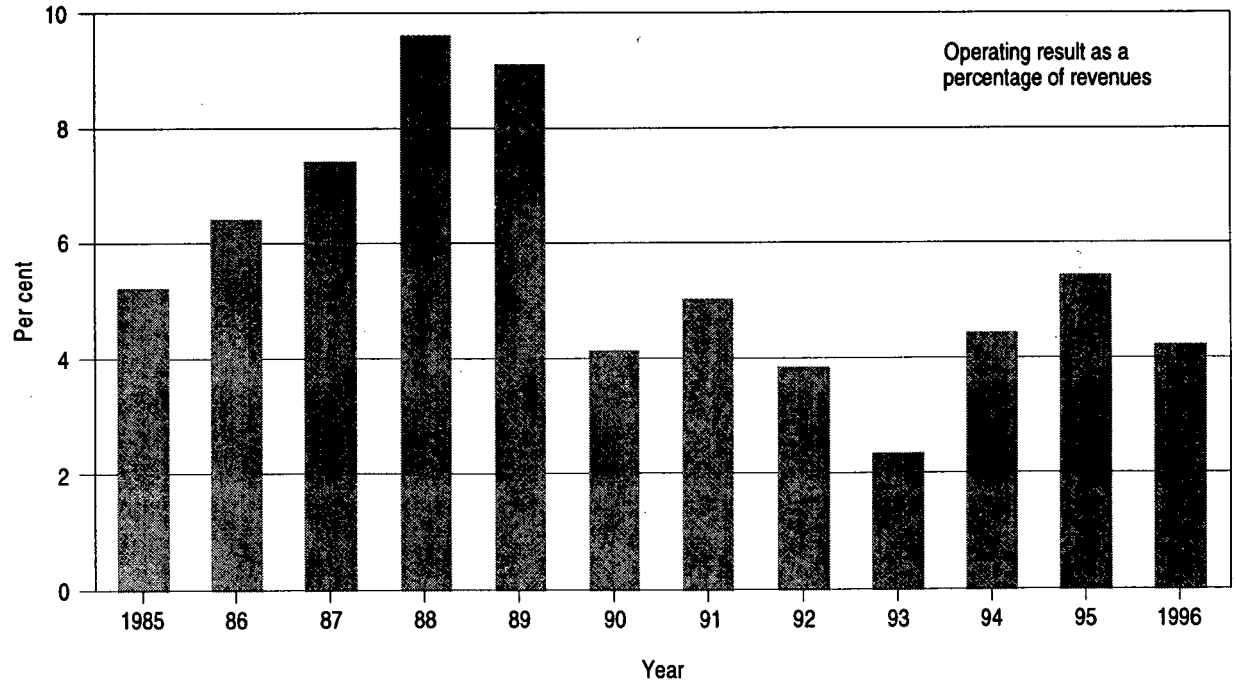
6.18 Economic growth in the region slowed in the 1991 to 1993 period, primarily because of a substantial slowdown in the Japanese economy. Recovery in Japan is progressing at a slow pace despite low interest rates and active fiscal stimulus. The developing economies of the region are expected to grow rapidly, fuelled by market-oriented structural reforms and investment in infrastructure. The economies of Australia and New Zealand are also gaining momentum with growth rates of around 3 to 5 per cent per annum.



Source: IMF, WEFA Group.

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





Note.— 1996 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

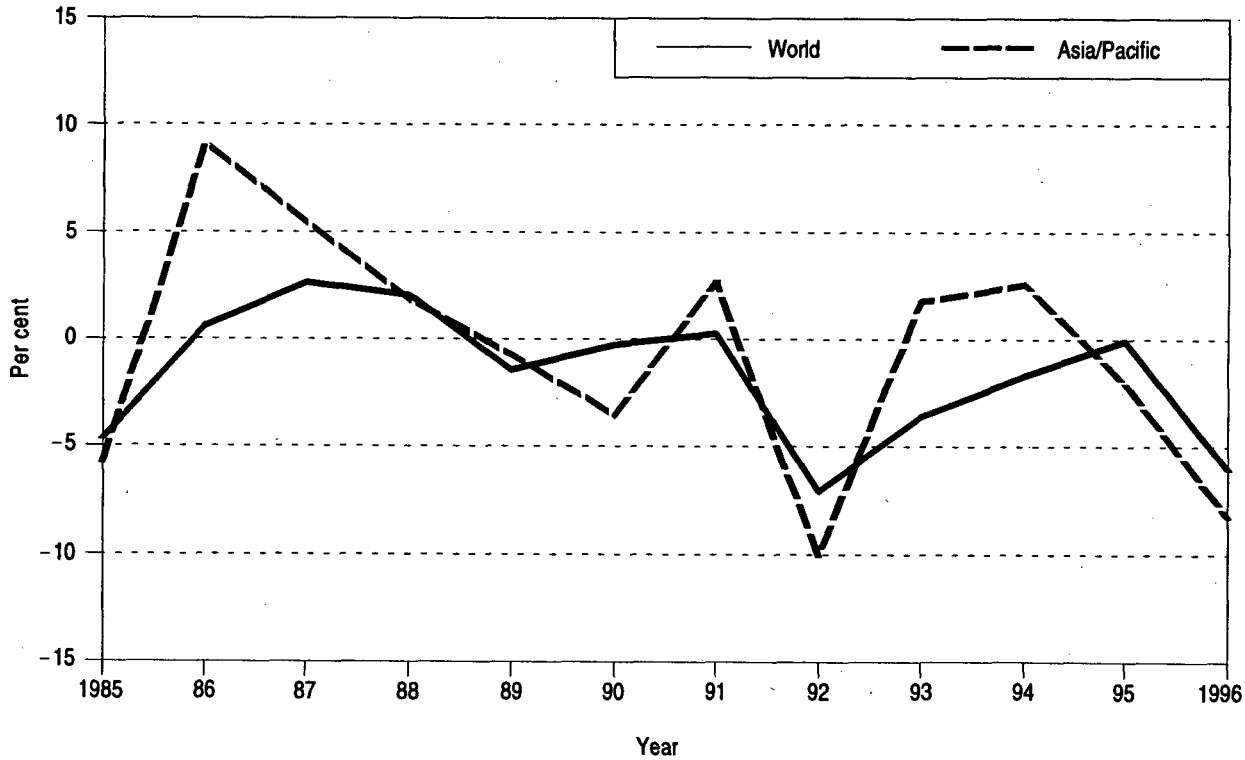
Figure 6-6. Scheduled airline operating revenues and expenses — Asia/Pacific

6.19 For the region as a whole, economic growth in 1996 is estimated to be about 5.6 per cent. Real growth in GDP is expected to be 5.0 per cent in 1997, 5.4 per cent in 1998 and 5.3 per cent in 1999.

Airline financial trends

6.20 Over the 1985-1995 period, operating revenues of the scheduled airlines of the Asia/Pacific region increased at an average annual rate of 13.7 per cent (compared to the world average annual growth rate of 9.1 per cent). Operating expenses for the same period also increased by 13.7 per cent per annum. In contrast to other regions, positive aggregate operating results have been achieved throughout the last decade, illustrated in Figure 6-6.

6.21 Average scheduled passenger yields for airlines of the region, measured in terms of cents per PKP, have fluctuated significantly since 1985. This is illustrated in Figure 6-7,



Notes: — *1996 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

which compares the annual changes in real yield for the Asia/Pacific scheduled airlines with those for the total world's airlines. The sharp increase in yield in U.S. cents in 1986 in part reflects a decline of 30 per cent in the value of the U.S. dollar against the yen.

Airline passenger traffic trends and forecast

6.22 Over the 1985-1995 period, scheduled passenger traffic (PKP) of airlines of the Asia/Pacific region increased at an average annual rate of 9.7 per cent (compared to the world annual average of 5.1 per cent). Further strong growth in traffic (8.3 per cent) was estimated for 1996. The year-to-year traffic growth comparison between world and Asia/Pacific airlines is shown in Figure 6-8.

6.23 As shown in Table 5-6 and illustrated in Figure 6-8, scheduled passenger traffic of the airlines of the Asia/Pacific region is expected to increase by 8.5, 9.6 and 10.2 per cent for the years 1997, 1998 and 1999, respectively, compared to world airline growth of 6.2, 6.4 and 6.6 per cent. The outlook for traffic growth of the airlines of the Asia/Pacific region is the strongest of any ICAO region.

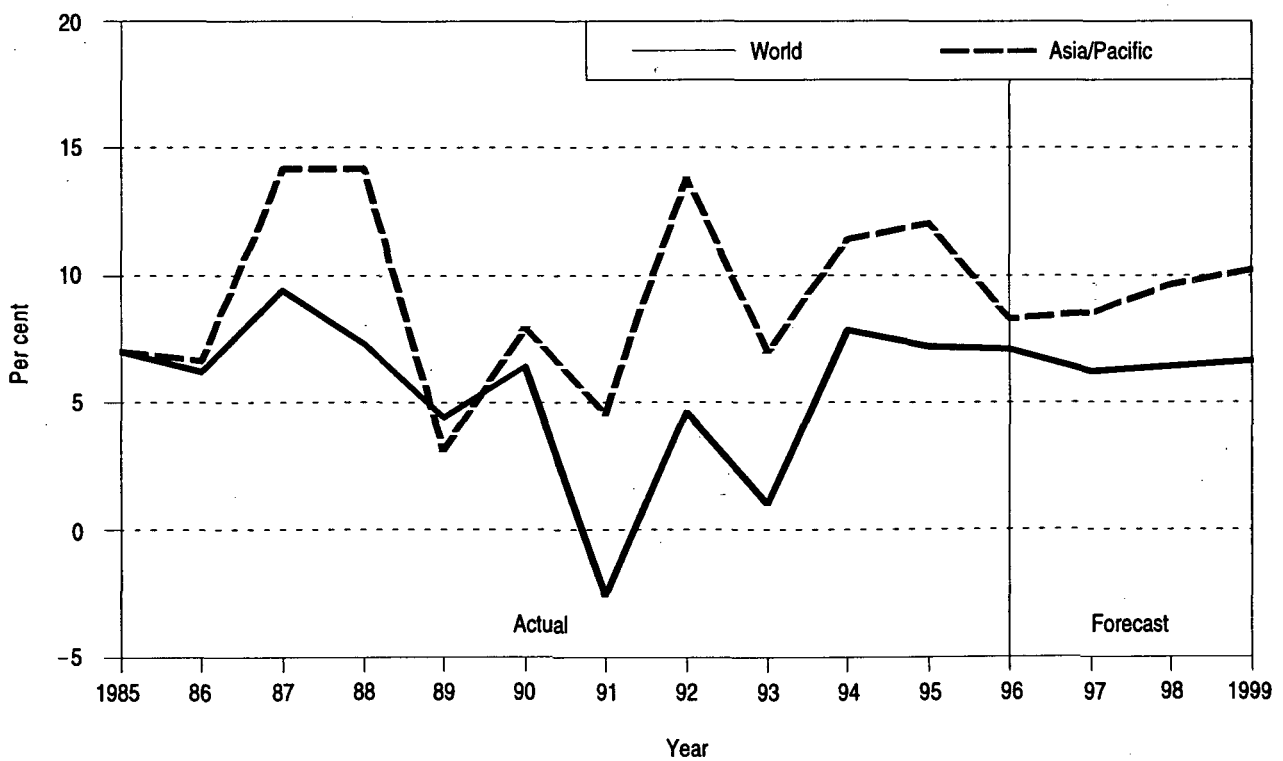


Figure 6-8. Scheduled passenger traffic growth (PKPs) — Asia/Pacific and World

EUROPE

The Region in 1996

Table 6-3. Scheduled traffic — airlines of Europe

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	175 020	7.8	42.9	316 030	4.0	22.9
Passenger-kilometres performed (millions)	474 840	8.4	34.8	591 750	5	24.5
Freight and mail tonne-kms performed (millions)	25 660	4.1	33.0	26 610	3.8	28.1

Source: ICAO Air Transport Reporting Form A-1.

6.24 The initiatives taken by the European Civil Aviation Conference (ECAC) to optimize the European Air Traffic Management System continued in 1996 and a number of questions of major concern to the industry were pursued in a dialogue between ECAC, EUROCONTROL and the industry. These cover the areas of capacity, costs and delays.

6.25 A study on the institutional arrangements best suited to implement the future European Air Traffic Management System was undertaken by ECAC in close co-operation with the European Union. The results of this work were to be presented to a meeting of ECAC Transport Ministers to be held in February 1997. Within the framework of preparations for the Ministerial meeting, Directors General agreed to propose to Ministers the consolidation of the APATSI (Airport/Air Traffic System Interface) programme and EATCHIP (European Air Traffic Control Harmonization and Integration Programme) into a total systems approach, to be managed by EUROCONTROL.

6.26 With regard to Airports Strategy, work continued on capacity-enhancing measures within the field of air traffic management procedures. The Central Office for Delay Analysis (CODA) became operational, managed by EUROCONTROL.

6.27 Principles in the field of airport charges were finalized as ECAC's contribution to work on the subject in the European Union.

6.28 In the economic field, ECAC approved a recommendation on codesharing which particularly concentrates on consumer protection measures. To help the consumer, ECAC

looked at the information needs of the passenger through all phases of a journey, beginning from the time that a first inquiry is made to a travel agency or airline ticket office. A comprehensive list of needs has been drawn up which is being addressed not only to the airlines but also to information data providers, including computer reservation system providers. Travel agents and airport authorities are also targeted.

6.29 Progress was made with respect to the implementation of Recommendation ECAC/16-1 on air carriers' liability with regard to passengers, with the development of an intercarrier agreement and of complementary regulatory elements. During the year, ECAC set up a Task Force on Leasing and Related Issues which is to undertake a study of the economic aspects of leasing from a liberalization perspective and to consider safety aspects in co-operation with the Joint Aviation Authorities. ECAC also established a Legal Task Force which in December 1996 started work on developing a model safety clause to be included in bilateral agreements.

6.30 Work by ECAC in the environmental area continued. Initial drafting took place of a proposal for a rule to restrict the addition, to carriers' existing fleets, of aircraft that comply with the noise limits of Annex 16, Chapter 3, only as a result of hushkitting. In addition, further efforts were made on the emissions database.

6.31 The continued objective in the field of civil aviation security in 1996 was the implementation of a common set of security provisions, based on Annex 17 and ECAC's Doc 30, in a harmonized fashion on a Europe-wide basis. To this end, work continued on security of cargo, bomb threats to aircraft while in flight, X-ray equipment specifications, detection of detonators, etc.

Economic trends

6.32 The aggregate European economy (GDP) grew steadily between 1985 and 1989 after which it went into decline. By 1994, total output was back to where it had been in 1985, the primary reason being the serious decline in the economies of eastern Europe and the CIS beginning in 1990. The impact of this is illustrated in Figure 6-9, which shows the annual European GDP growth including and excluding the CIS and eastern Europe. Western Europe achieved a positive average annual growth in GDP of 2.4 per cent per annum over the past decade.

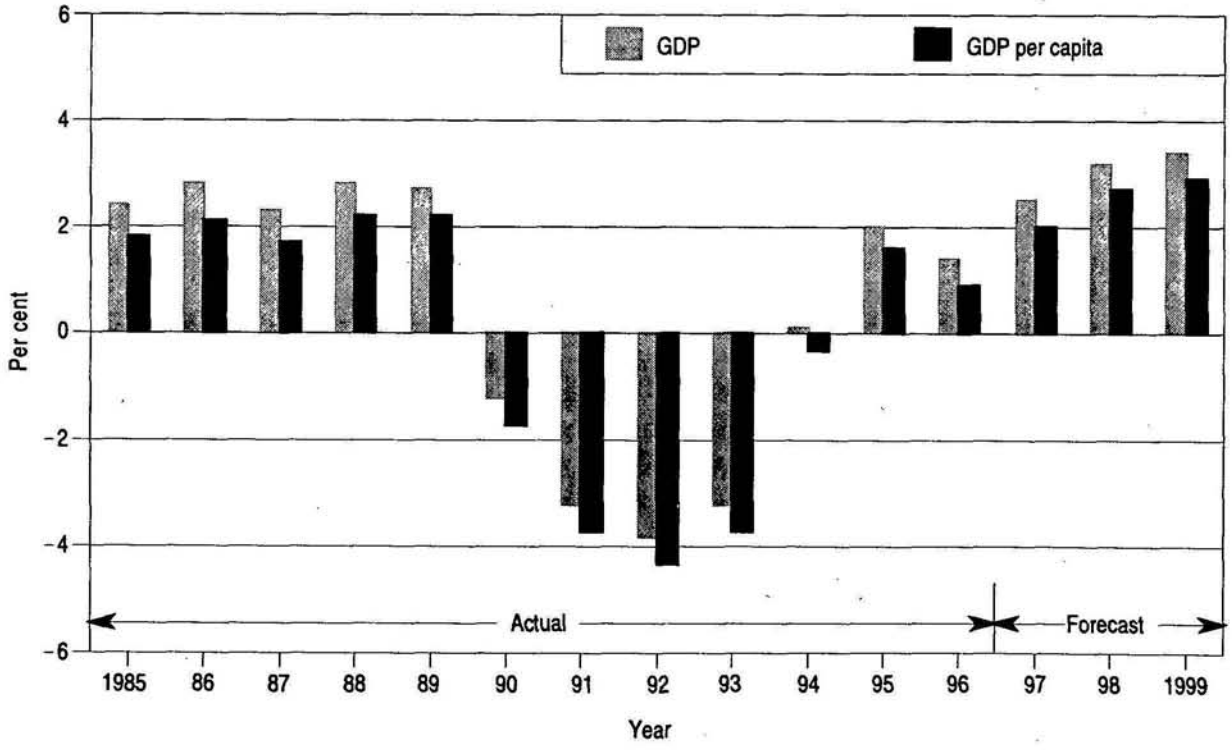
6.33 Europe has a relatively low population growth rate. The European population grew at 0.5 per cent per annum between 1985 and 1995, which means that aggregate GDP per capita for the whole region (including the CIS) declined by about 5 per cent between these years.

6.34 Recovery from recession commenced in western Europe and in the formerly centrally-planned economies of eastern Europe in 1994, and is expected to commence in the CIS in 1997. The outlook for western Europe is for moderate growth despite short-term difficulties in Germany and France. It is assumed that market-oriented reforms will bear fruit

in eastern Europe and the CIS over the next three years. GDP growth rates for the whole of Europe are forecast to be 2.5 per cent, 3.2 per cent and 3.4 per cent for 1997, 1998 and 1999, respectively. However, because of the structural changes that are occurring, there is an unusually large element of uncertainty associated with the economic outlook for the region.

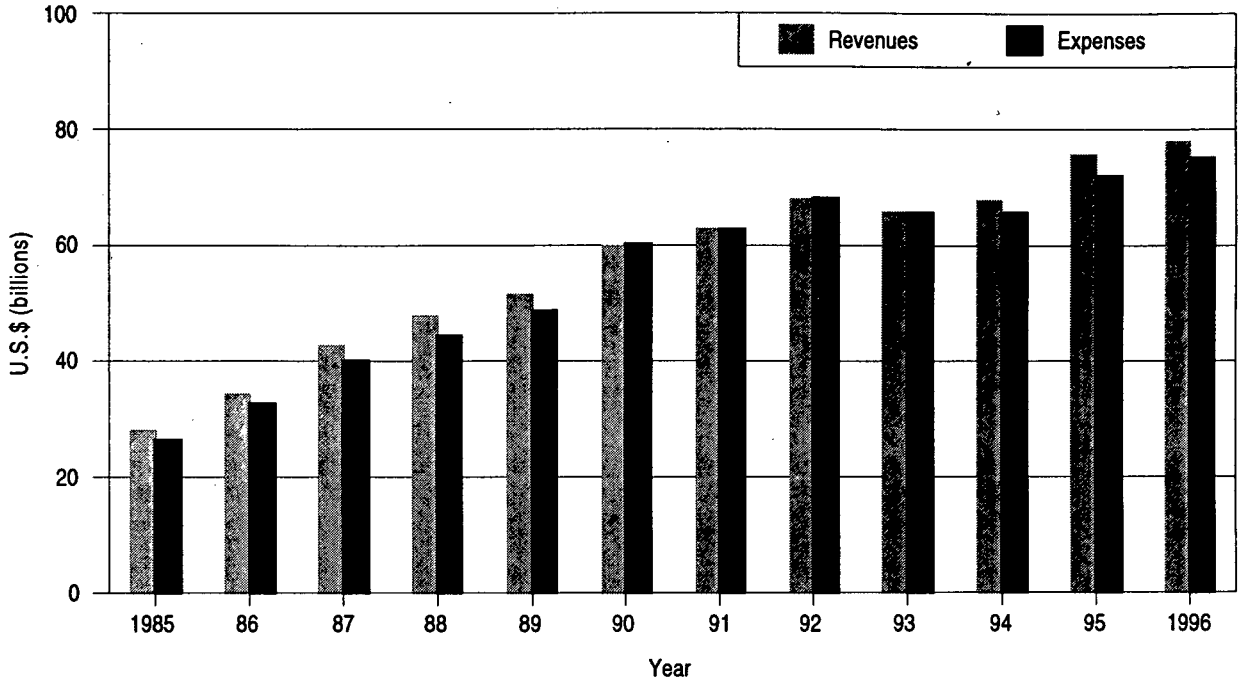
Airline financial trends

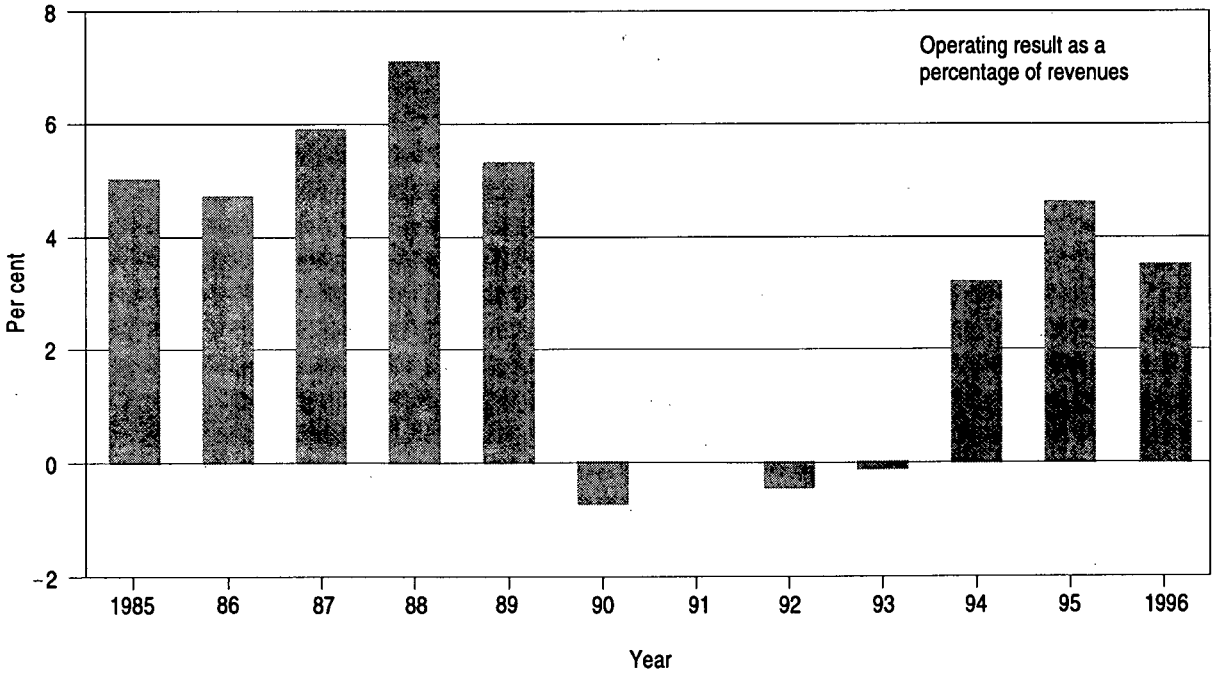
6.35 Over the 1985-1995 period, operating revenues of the scheduled airlines of the European region (excluding the CIS) increased at an average annual rate of 10.5 per cent (compared to the world annual average of 9.1 per cent). Operating expenses for the same period also increased by 10.5 per cent per annum. As illustrated in Figure 6-10, positive operating results were achieved in the years 1985 to 1989, negative results incurred in 1990, 1992 and 1993, followed by a return to operating profits in 1994, 1995 and 1996. A net profit was also earned in 1995, the first since 1989 (net figures for 1996 were not available at time of writing).



Source: IMF, WEFA Group.

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





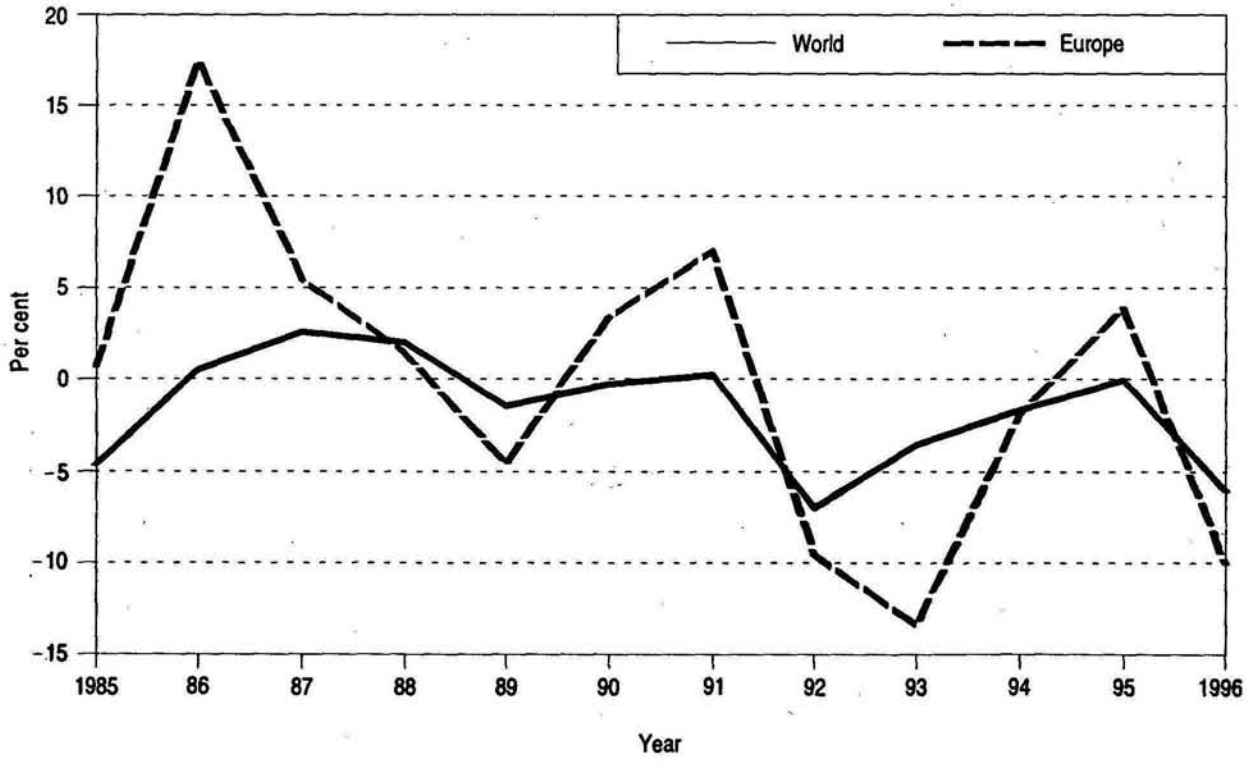
Note.— 1996 figures are from estimated data.
Source: ICAO Air Transport Reporting Form EF-1.

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

6.36 Annual changes in average scheduled passenger yields for airlines of the region (excluding the CIS), are shown for the 1985-1996 period in Figure 6-11. The yields are measured in terms of U.S. cents per PKP and deflated by the U.S. Consumer Price Index. 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 in that year. There were sharp declines in yield in 1992 and 1993, when the presence of excess capacity heightened competitive pressures in airline markets. In 1995 it was estimated that real yields climbed for the first time since 1991.

Airline passenger traffic trends and forecast

6.37 Over the 1985-1995 period, scheduled passenger traffic (PKP) of the airlines of the European region increased at an average annual rate of only 2.8 per cent (compared to the world annual average of 5.1 per cent) despite a generally impressive performance in western Europe (except in 1991). If airlines of the CIS are excluded, European traffic grew at 7.3 per



Notes: — *1996 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

cent per annum over the period. After a period of severe decline, CIS traffic volumes began to level out in 1994 and 1995, though they continued to decline in 1996, and total European traffic grew at or above 5 per cent in each of these three years. The year-to-year traffic growth comparison of the world's and the European airlines is shown in Figure 6-12.

6.38 As shown in Table 5-6 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 1997. For the region as a whole, growth rates of 5.9 per cent, 6.5 per cent and 6.6 per cent for the years 1997, 1998 and 1999, respectively, are expected (compared to world airline growth of 6.2, 6.4 and 6.6 per cent).

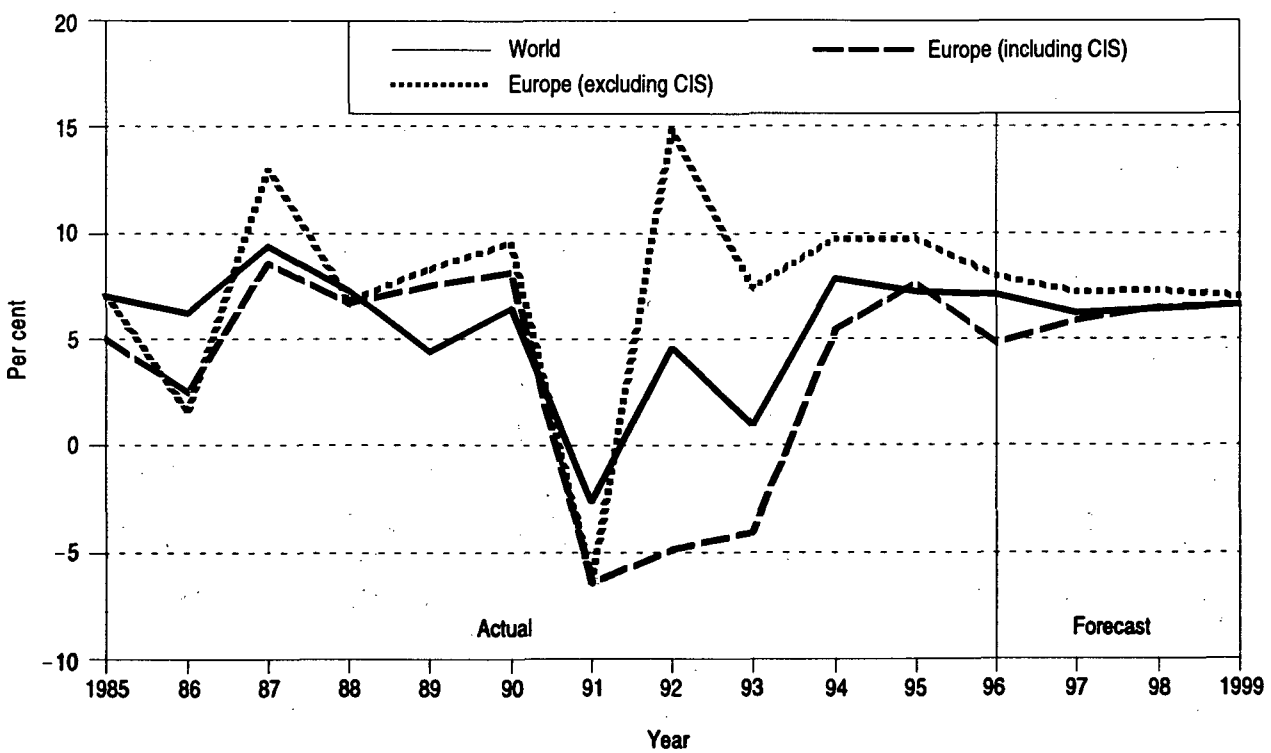


Figure 6-12. Scheduled passenger traffic growth (PKPs) — Europe and World

MIDDLE EAST

The Region in 1996

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

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	19 720	5.0	4.8	35 960	7.8	2.6
Passenger-kilometres performed (millions)	60 920	6.8	4.5	72 010	7.6	3.0
Freight and mail tonne-kms performed (millions)	3 960	5.4	5.1	4 050	5.5	4.3

Source: ICAO Air Transport Reporting Form A-1.

Economic trends

6.39 The Middle East economy has been characterized by several pronounced cycles over the past decade, as illustrated in Figure 6-13 which presents the year-to-year changes in the region's GDP and GDP per capita. 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 three years. Over the 1985-1995 period, the aggregate GDP for the Middle East grew at an average annual rate of 2.7 per cent in real terms, although GDP per capita fell at 0.8 per cent per annum.

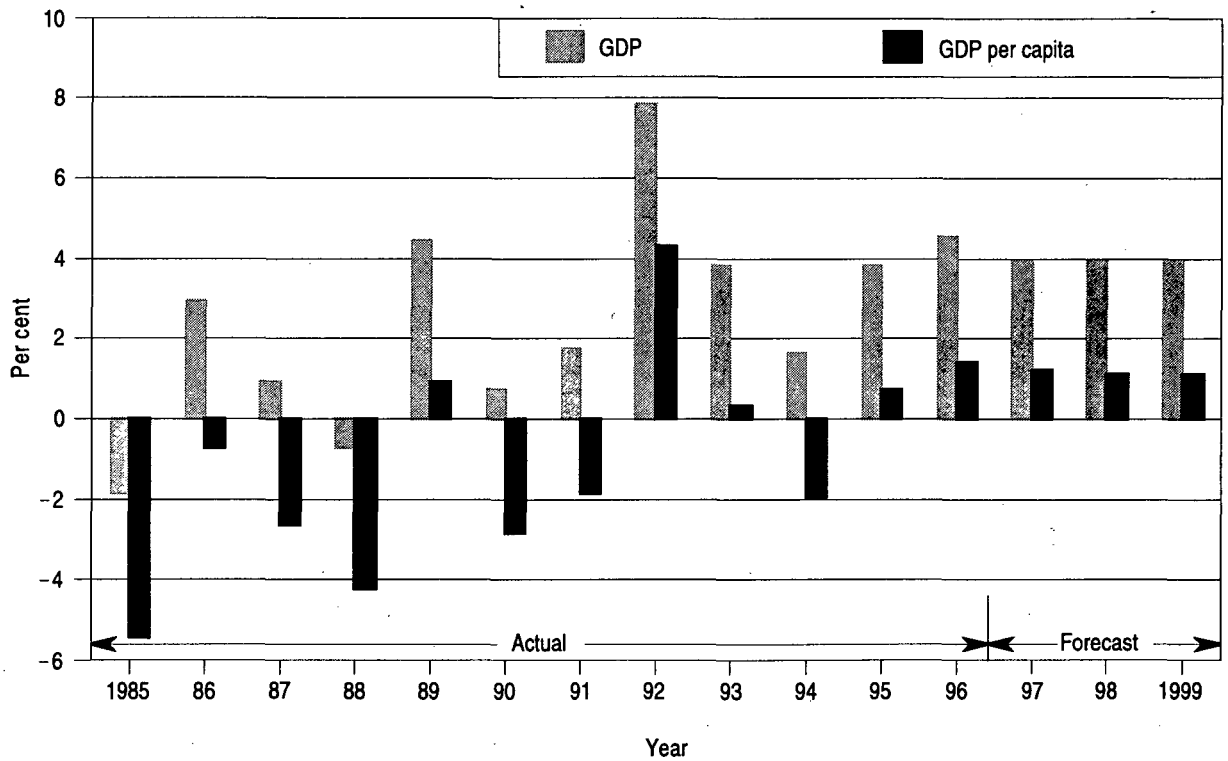
6.40 Prospects for this region are particularly dependent on oil market developments and fiscal consolidation policies. A generally improved economic outlook is expected, with a forecast GDP growth rate of 3.9 per cent, for each of the years 1997, 1998 and 1999.

Airline financial trends

6.41 Over the 1985-1995 period, operating revenues of the scheduled airlines of the Middle East region increased at an average annual rate of 3.8 per cent (compared to the world annual average of 9.1 per cent). Operating expenses for the same period increased by 4.3 per

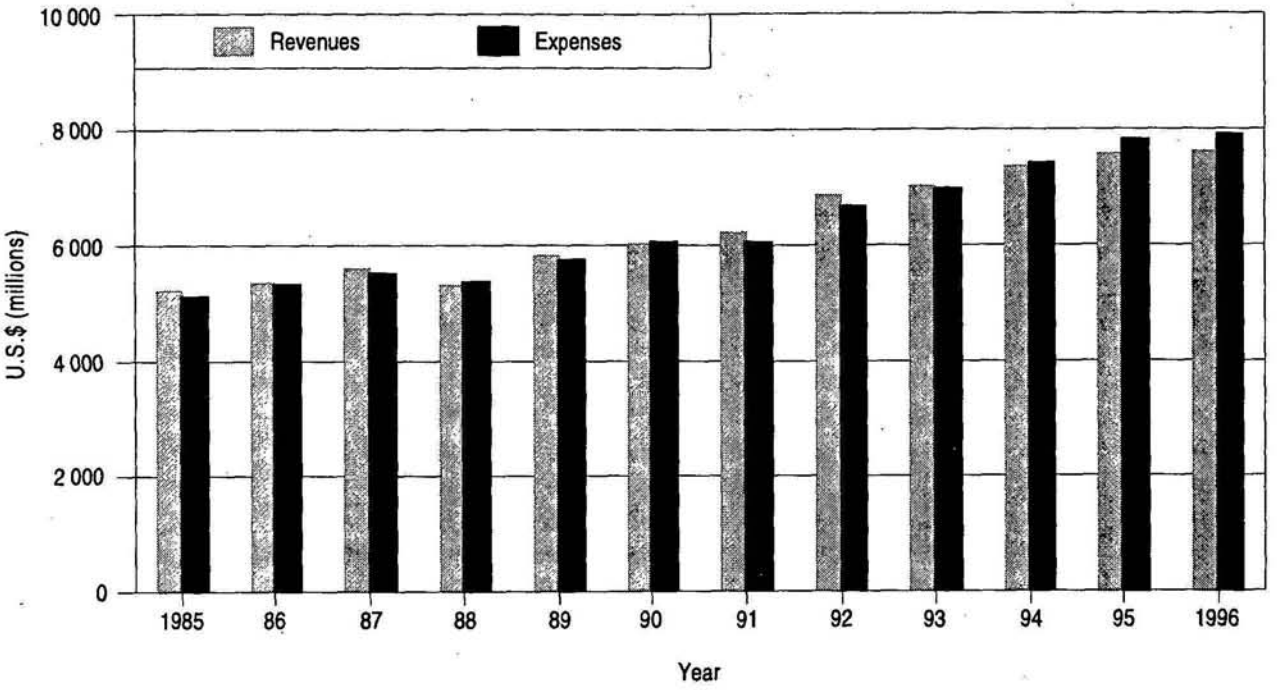
cent per annum. As shown in Figure 6-14, the region experienced three years of operating losses over the period; the loss in 1995 contrasts with the positive results of all other regions and occurred in the context of a sharp increase in traffic and an even greater increase in capacity.

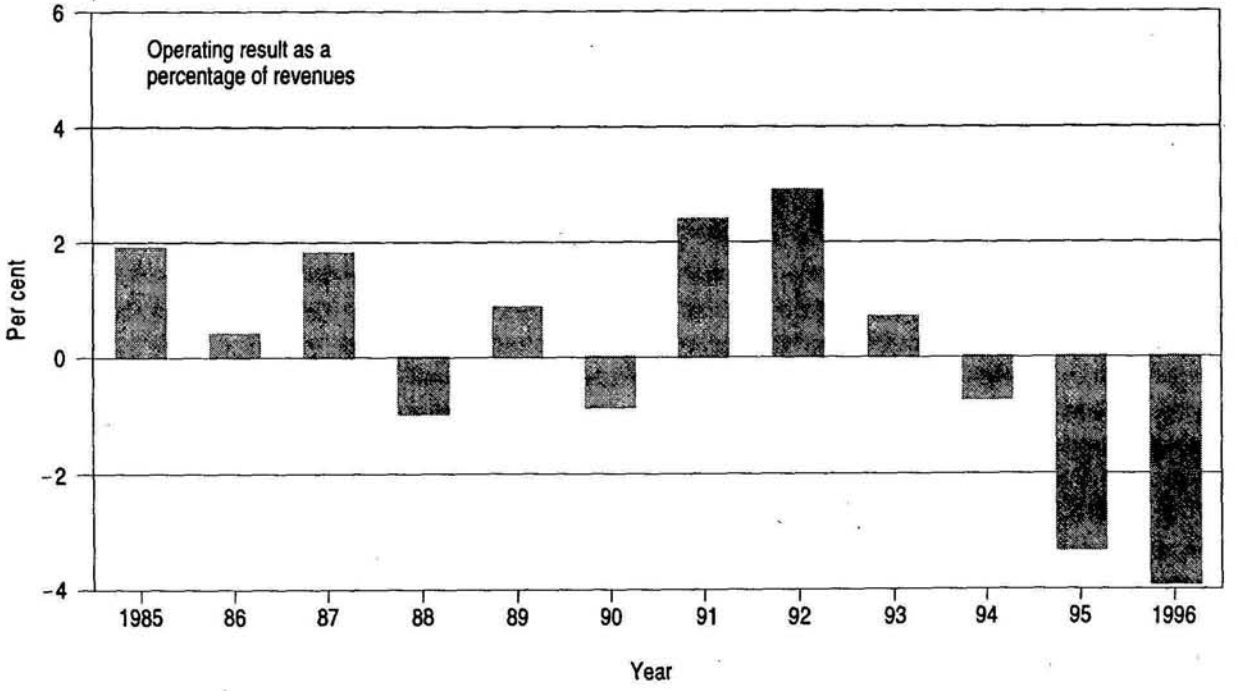
6.42 For the 1985-1995 period, average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP, declined at an average annual rate of 4.8 per cent in real terms (compared to a 0.9 per cent decline for the world). It is estimated that the real yield declined by about 10 per cent in 1995. The year-to-year comparisons of the changes in real passenger yields of Middle East and world airlines are illustrated in Figure 6-15.



Source: IMF, WEFA Group.

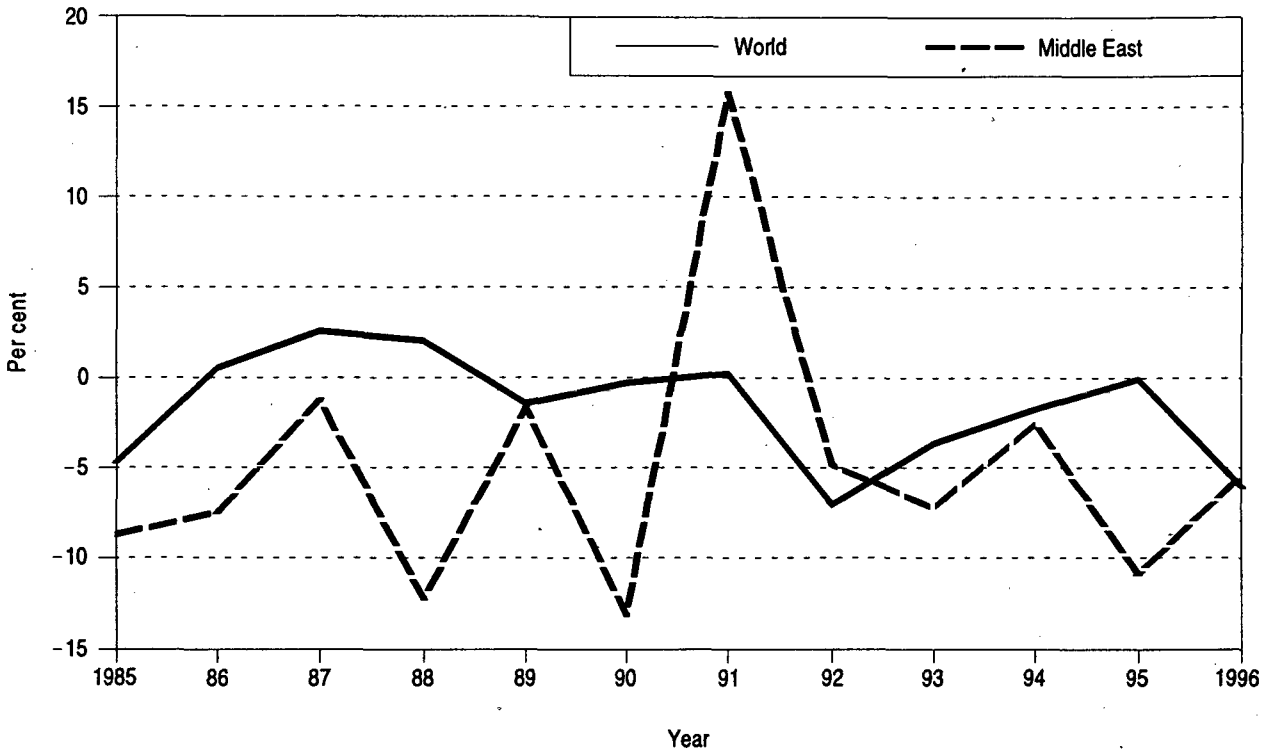
Figure 6-13. Annual change in real GDP and GDP per capita — Middle East





Note.— 1996 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: — *1996 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

Airline passenger traffic trends and forecast

6.43 Over the 1985-1995 period, scheduled passenger traffic (PKP) of the airlines of the Middle East region increased at an average annual rate of 4.6 per cent (compared to the world annual average of 5.1 per cent). Traffic growth has been reasonably buoyant since the declines in 1990 and 1991 associated primarily with the Gulf War. The year-to-year traffic growth comparison between world and Middle East airlines is shown in Figure 6-16.

6.44 As shown in Table 5-6 and illustrated in Figure 6-16, scheduled passenger traffic for the airlines of the Middle East region is expected to increase by 6.8 per cent per annum in 1997, 6.5 per cent in 1998 and 6.7 per cent in 1999. This rate reflects an expected good economic performance.

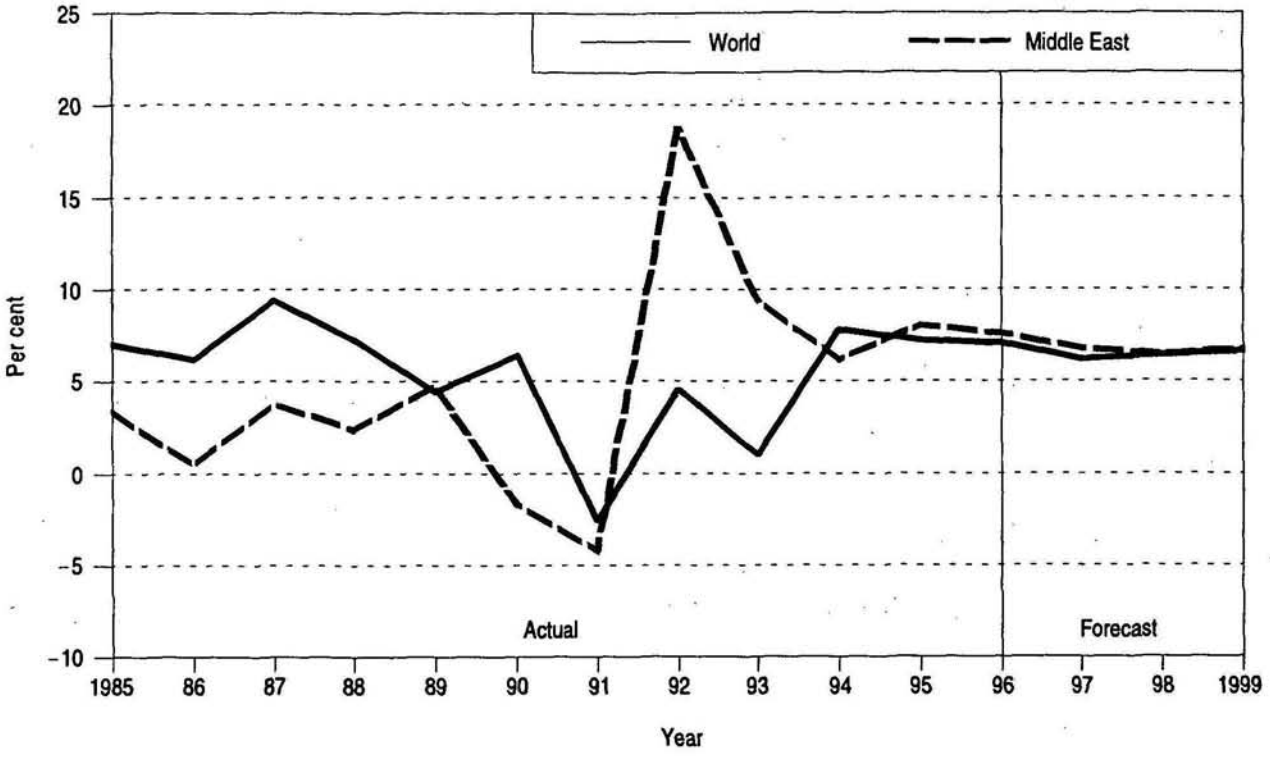


Figure 6-16. Scheduled passenger traffic growth (PKPs) — Middle East and World

NORTH AMERICA

The Region in 1996

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

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	66 810	9.5	16.3	591 210	7.3	42.9
Passenger-kilometres performed (millions)	286 660	7.9	21.0	970 150	7.7	40.3
Freight and mail tonne-kms performed (millions)	14 400	11.9	18.5	26 940	9.5	28.4

Source: ICAO Air Transport Reporting Form A-1.

6.45 The United States Department of Transportation (DOT) granted immunity from U.S. anti-trust laws to American Airlines and Canadian Air Lines. DOT also decided to grant Delta Air Lines, Austrian Airlines, Sabena and Swissair restricted immunity from U.S. anti-trust laws over co-ordination of their air services.

6.46 The United States Government approved a bill restoring FAA funding for three years, reinstating the airline passenger ticket tax and authorizing the agency to impose a fee on foreign airlines flying over the airspace controlled by the United States.

Economic trends

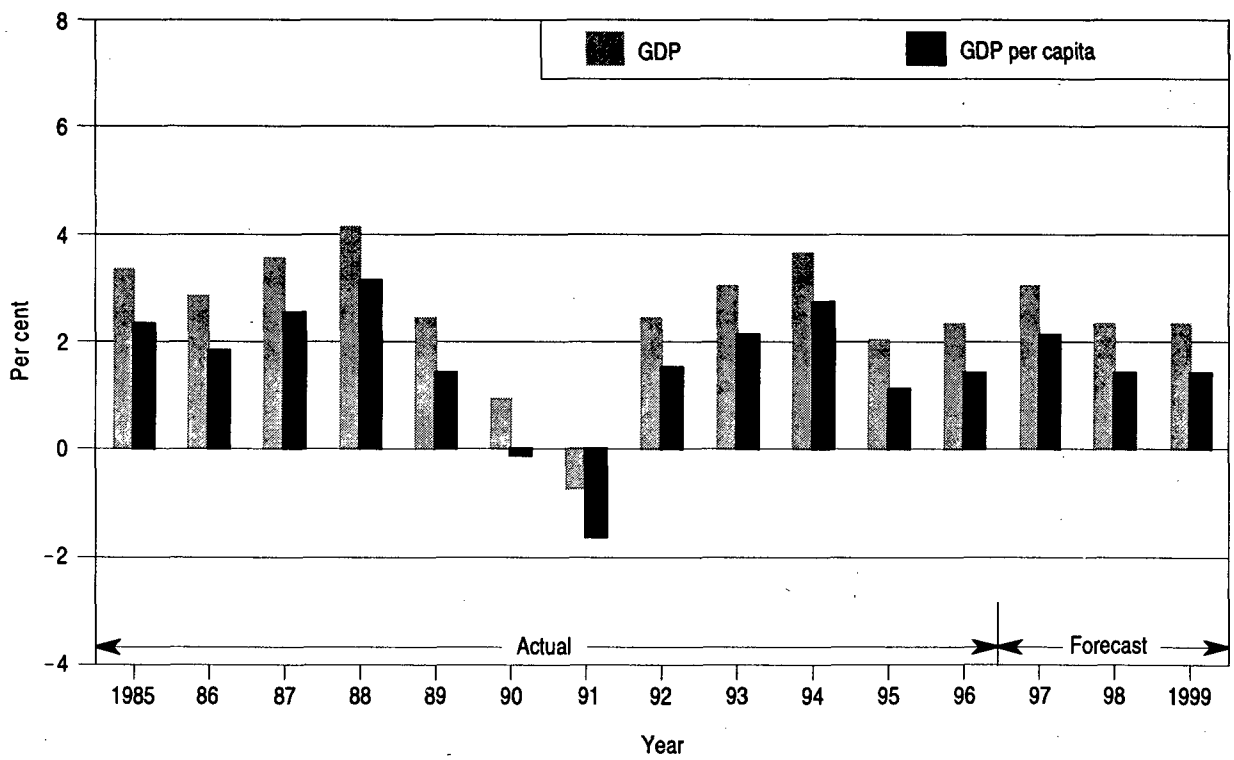
6.47 Over the 1985-1995 period, the aggregate North American economy (GDP) grew at an average annual rate of 2.5 per cent in real terms, and GDP per capita increased at 1.5 per cent per annum. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-17.

6.48 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 2.3 per cent in 1996. North American GDP is expected to grow at 3.0 per cent, 2.3 per cent and 2.3 per cent in 1997, 1998 and 1999, respectively.

Airline financial trends

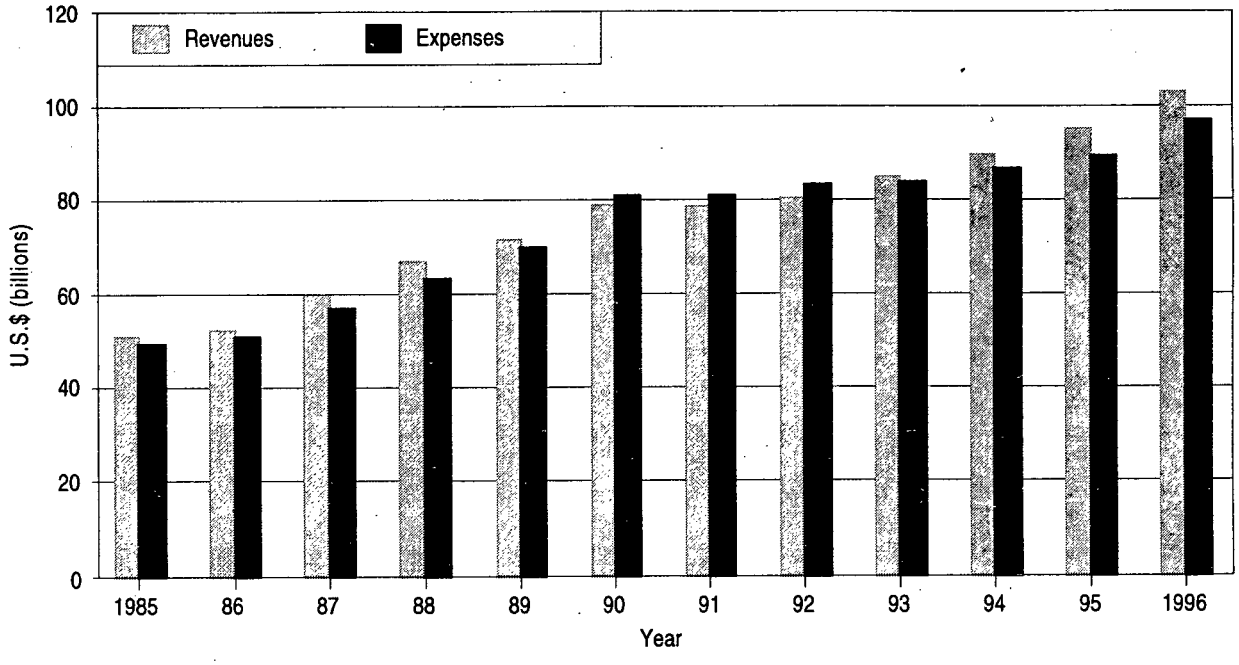
6.49 Over the 1985-1995 period, operating revenues of the scheduled airlines of the North American region increased at an average annual rate of 6.5 per cent (compared to the world annual average of 9.1 per cent). Operating expenses for the same period increased by 6.1 per cent per annum. The string of operating surpluses in the 1985 to 1989 period gave way to serious deficits in 1990, 1991 and 1992 as illustrated in Figure 6-18. Operating surpluses have been earned since 1992, including an especially good result in 1995.

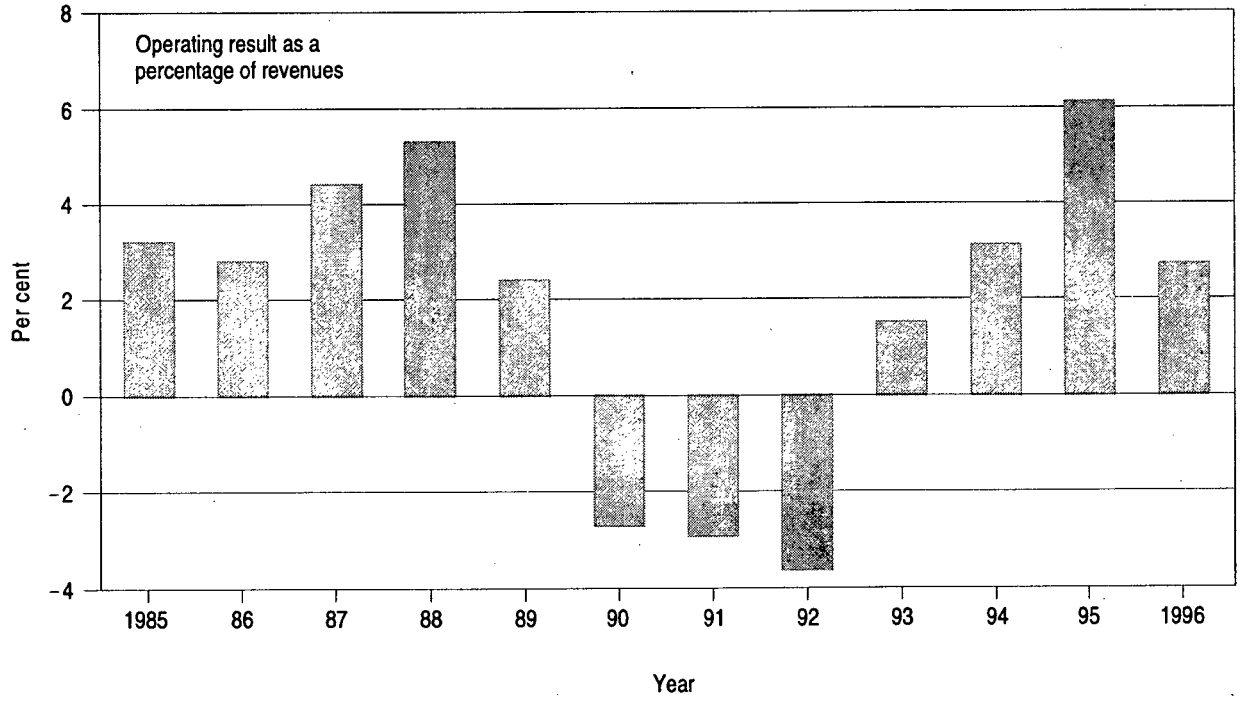
6.50 For the 1985-1995 period, average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP, declined at an average annual rate of 2.4 per cent in real terms (compared to a 0.9 per cent decline for the world). It is estimated that the real yield remained virtually unchanged in 1995. The year-to-year comparisons of the changes in the real passenger yields 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 and in 1995 remained the lowest of any region.



Source: IMF, WEFA Group.

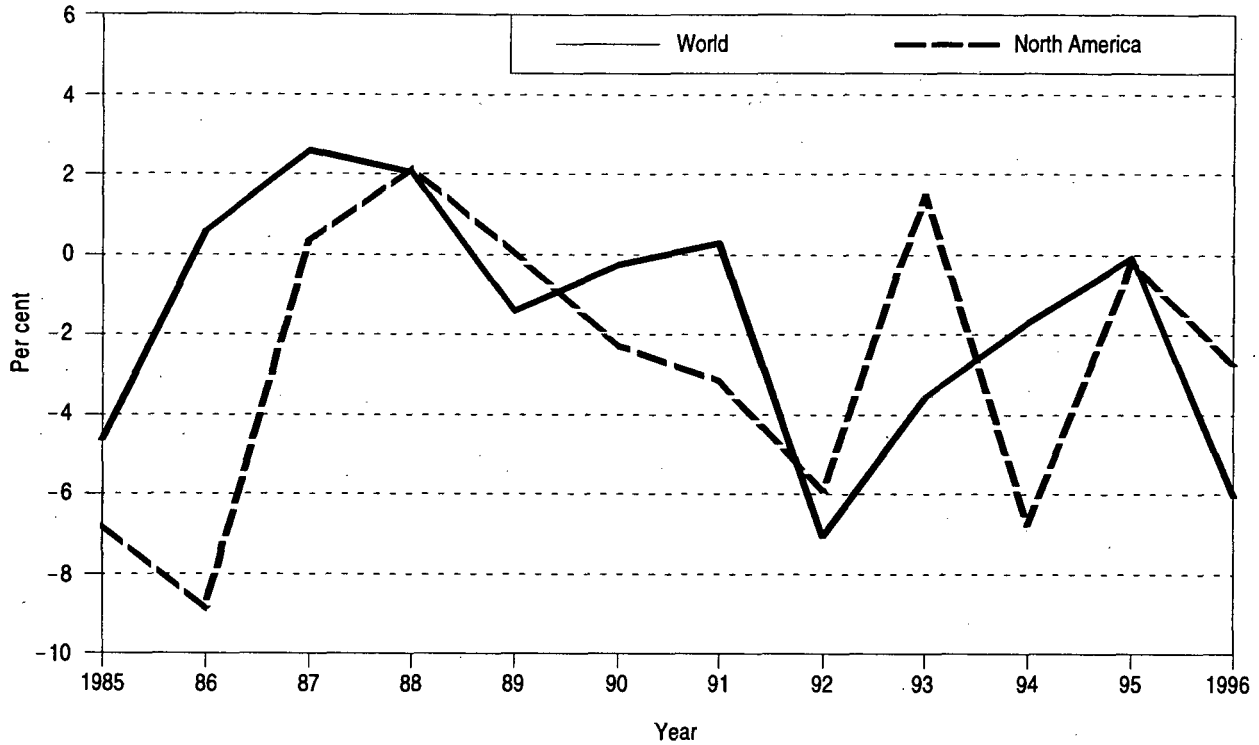
Figure 6-17. Annual change in real GDP and GDP per capita — North America





Note.— 1996 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: — *1996 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

6.51 Over the 1985-1995 period, scheduled passenger traffic (PKP) of the airlines of the North American region increased at an average annual rate of 4.7 per cent (compared to the world average of 5.1 per cent). Traffic growth of about 7.7 per cent has been estimated for 1996. The year-to-year traffic growth comparison between world and North American airlines is shown in Figure 6-20.

6.52 As shown in Table 5-6 and illustrated in Figure 6-20, scheduled passenger traffic for the airlines of the North American region is expected to increase by 4.7 per cent in 1997, 4.1 per cent in 1998, and 4.2 per cent in 1999. These rates are below the expected growth pattern for the world as a whole (i.e. 6.2, 6.4 and 6.6 per cent for the same three years).

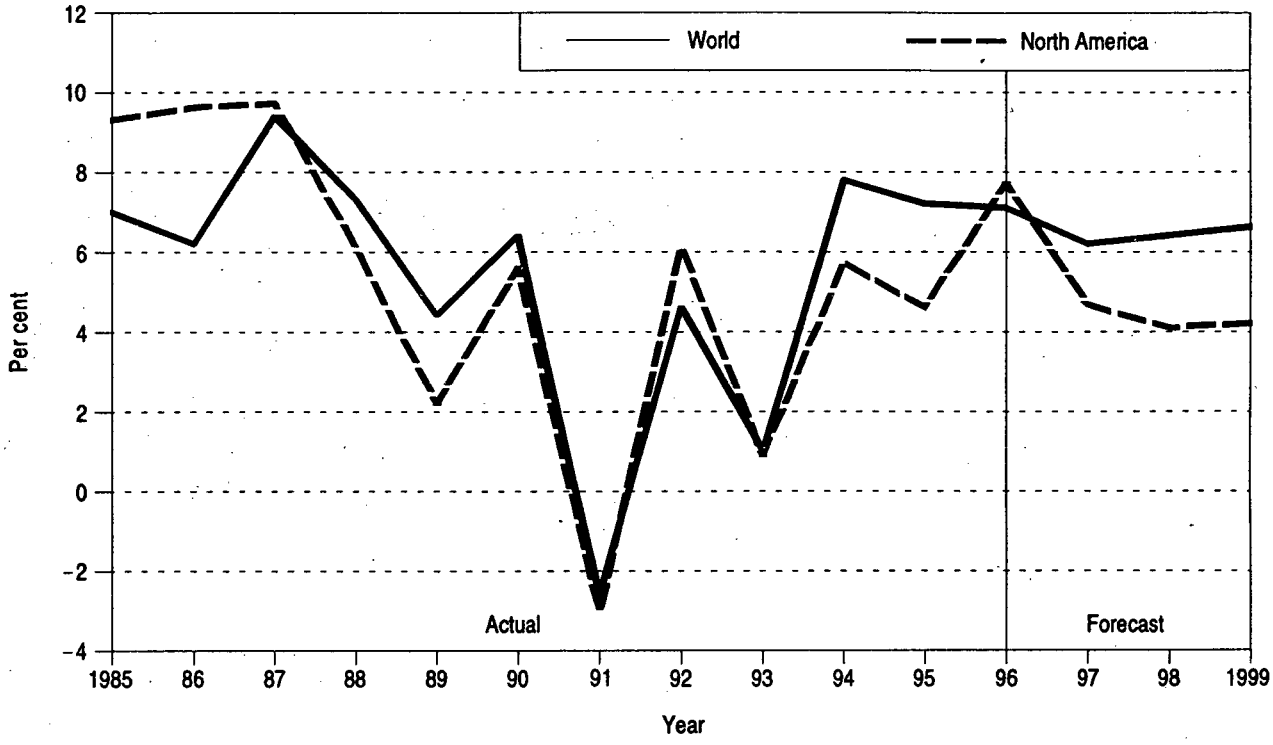


Figure 6-20. Scheduled passenger traffic growth (PKPs) — North America and World

LATIN AMERICA AND THE CARIBBEAN

The Region in 1996

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

	INTERNATIONAL			TOTAL		
	1996	Increase over 1995 (%)	Share of world traffic (%)	1996	Increase over 1995 (%)	Share of world traffic (%)
Passengers carried (thousands)	28 680	15.7	7.0	77 820	3.8	5.6
Passenger-kilometres performed (millions)	78 120	11.0	5.7	115 700	6.4	4.8
Freight and mail tonne-kms performed (millions)	3 280	4.4	4.2	3 950	2.1	4.2

Source: ICAO Air Transport Reporting Form A-1.

6.53 As described in Chapter 2, two new regional arrangements came into being in 1996. In July, 14 Member States of the Caribbean Community (CARICOM) concluded a Multilateral Agreement Concerning the Operation of Air Services within the Community, while in December 6 States (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay) signed an agreement on subregional air services.

6.54 In November, a Central American Forum on Civil Aviation Policy for Tourism was held in Tegucigalpa, Honduras. Ministers and Vice-ministers of Communication and Transport as well as tourism from all Central American States attended the meeting which dealt with liberalization of the regional air transport policy aimed at attracting more tourism to the area and adopting an "open skies" policy in the region. The Forum agreed to continue talks along these lines with Canada and the United States as well as continue efforts toward attaining a liberalized air transport policy within the region.

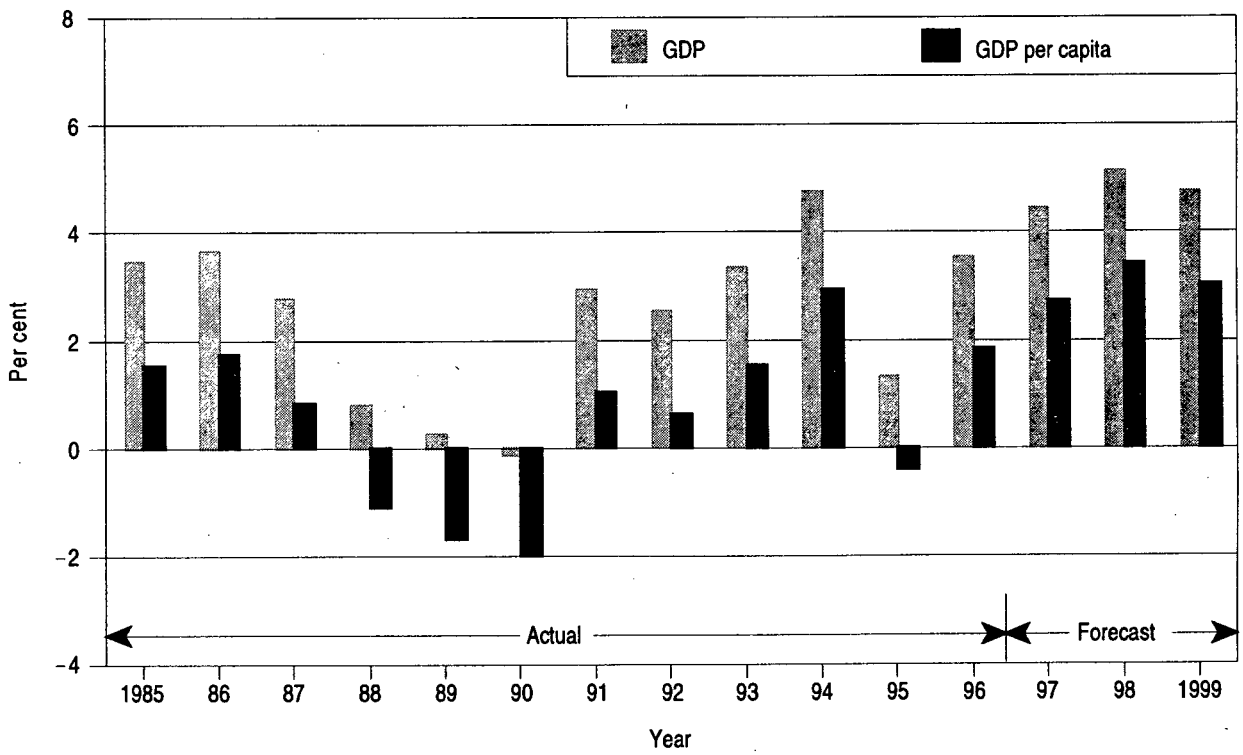
Economic trends

6.55 Over the 1985-1995 period, the aggregate Latin American/Caribbean economy (GDP) grew at an average annual rate of 2.2 per cent in real terms, although GDP per capita grew only at 0.3 per cent. The economy in this region was severely affected by recession in the late 1980s. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-21.

6.56 Trade liberalization and fiscal and structural reforms in the region have contributed to improved economic growth since 1990. In 1995, the economy of important parts of the region suffered from the effects of a financial crisis in Mexico and regional growth was estimated to be just 1.3 per cent. In 1996, this improved to an estimated 3.5 per cent and the outlook is encouraging, according to the assessments of the IMF and the WEFA Group. GDP for the region is forecast to grow at 4.4 per cent, 5.1 per cent and 4.7 per cent in 1997, 1998 and 1999, respectively.

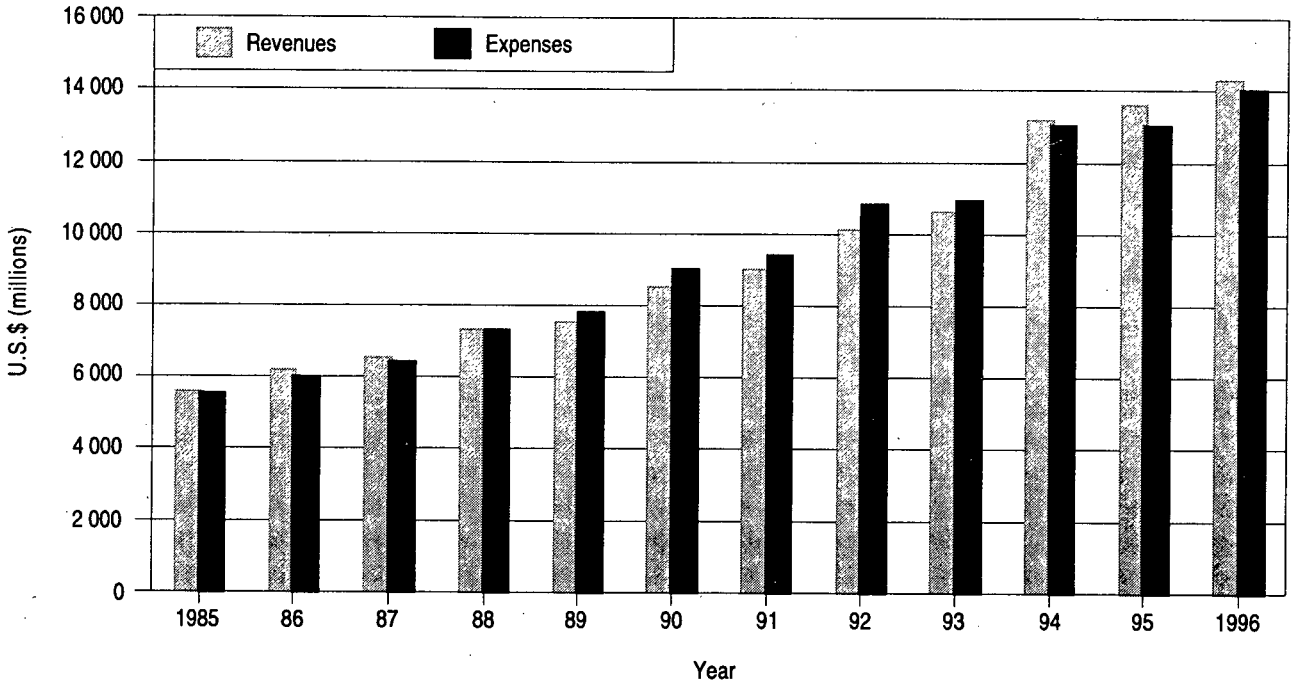
Airline financial trends

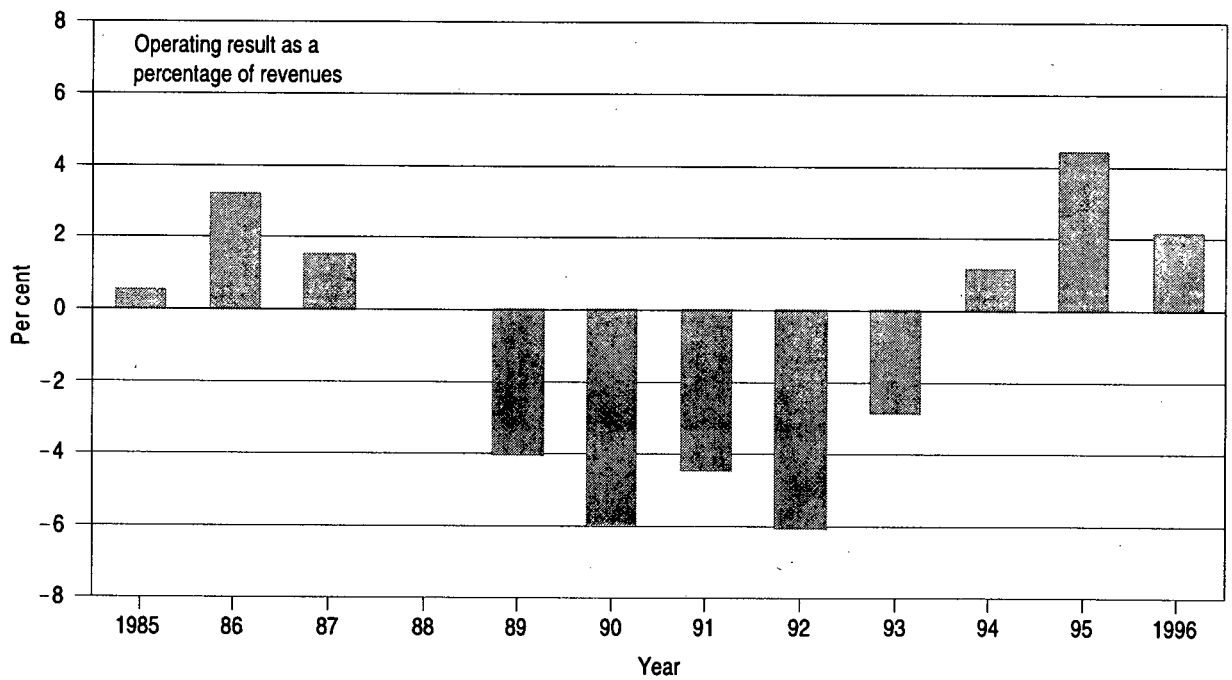
6.57 Over the 1985-1995 period, operating revenues of the scheduled airlines of the Latin American/Caribbean region increased at an average annual rate of 9.4 per cent (compared to the world annual average of 9.1 per cent). Operating expenses for the same period increased by 9.0 per cent per annum. The over-all financial performance of the airlines of the region has been poor over the whole period with five consecutive years (1989 to 1993) of serious operating losses, as illustrated in Figure 6-22. In a significant turnaround, the best operating result for many years was achieved in 1995, although the net result remained negative.



Source: IMF, WEFA Group.

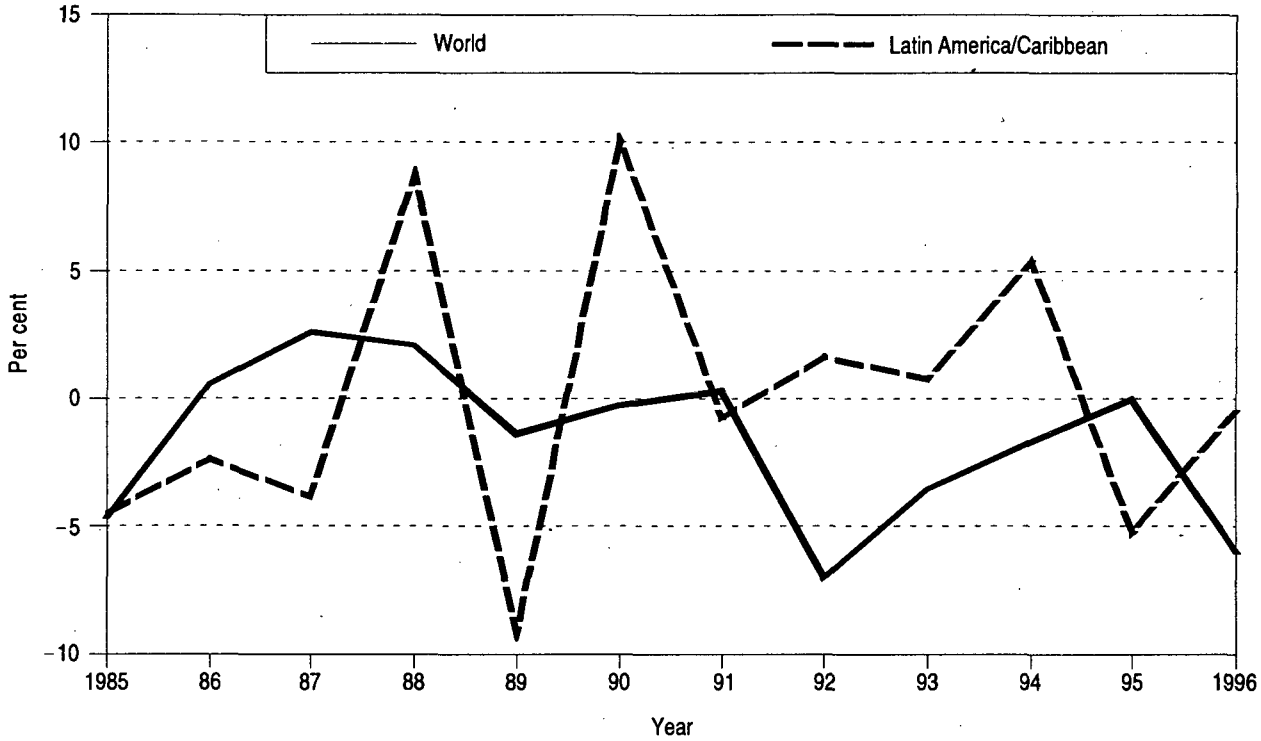
Figure 6-21. Annual change in real GDP and GDP per capita — Latin America/Caribbean





Note.— 1996 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: — *1996 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

6.58 Average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP and expressed in constant price terms, fluctuated substantially between 1985 and 1995, but there was no significant trend either up or down over the whole period. The year-to-year comparisons of the changes in real passenger yield of Latin American/Caribbean and world airlines are illustrated in Figure 6-23.

Airline passenger traffic trends and forecast

6.59 Over the 1985-1995 period, the scheduled passenger traffic (passenger-kilometres performed) of airlines of the Latin American/Caribbean region increased at an average annual rate of 4.8 per cent (just under the world average growth rate of 5.1 per cent). Traffic grew by a healthy 6.3 per cent in 1996 (estimated). The year-to-year traffic growth comparison between world and Latin American/Caribbean airlines is shown in Figure 6-24.

6.60 As shown in Table 5-6 and illustrated in Figure 6-24, and in response to expectations regarding economic performance, scheduled passenger traffic of the airlines of the Latin America and Caribbean region is forecast to increase at 7.0 per cent, 6.5 per cent and 6.3 per cent in 1997, 1998 and 1999, respectively, which is slightly above the expected growth pattern over this period for the world as a whole (6.2, 6.4 and 6.6 per cent).

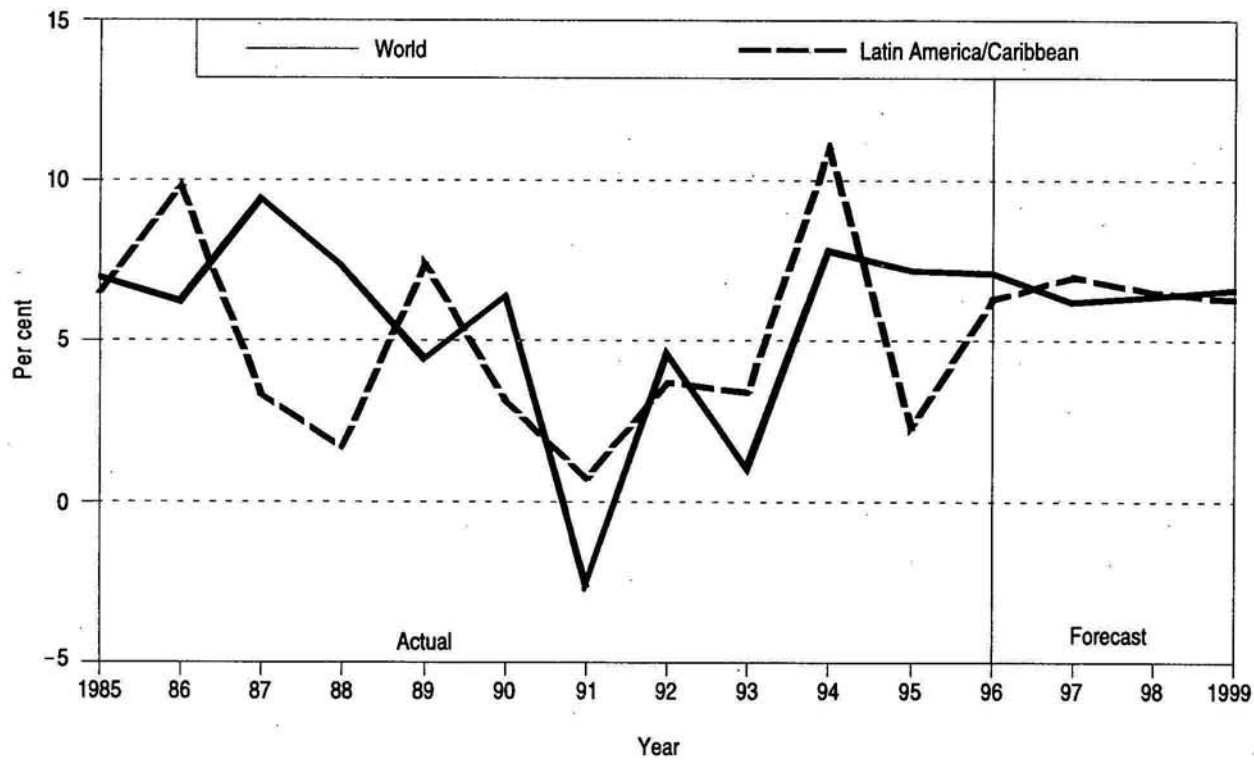


Figure 6-24. Scheduled passenger traffic growth (PKPs) — Latin America/Caribbean and World

APPENDICES

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 1
Statistical Tables

Table A1-1. Regional distribution of scheduled traffic — 1996

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	5 195	4 821	316 028	591 750	68	25 639	82 738	128 235	65
Percentage of world traffic	25.4	26.1	22.9	24.5		28.9	26.3	24.4	
Africa	491	447	28 816	55 430	63	1 497	6 430	12 690	51
Percentage of world traffic	2.4	2.4	2.1	2.3		1.7	2.0	2.4	
Middle East	514	368	35 959	72 012	67	3 981	10 472	18 095	58
Percentage of world traffic	2.5	2.0	2.6	3.0		4.5	3.3	3.4	
Asia and Pacific	3 830	3 045	329 740	605 967	68	30 606	85 546	139 530	61
Percentage of world traffic	18.7	16.5	23.9	25.1		34.4	27.2	26.6	
North America	9 110	8 307	591 209	970 147	70	23 342	114 804	199 160	58
Percentage of world traffic	44.6	44.9	42.9	40.3		26.3	36.5	38.1	
Latin America and Caribbean	1 300	1 503	77 819	115 704	61	3 745	14 690	26 850	55
Percentage of world traffic	6.4	8.1	5.6	4.8		4.2	4.7	5.1	
Total	20 440	18 491	1 379 571	2 411 010	68	88 810	314 680	524 560	60
International services of airlines of ICAO Contracting States									
Europe	3 783	2 491	175 022	474 837	69	24 860	71 117	108 340	66
Percentage of world traffic	41.0	53.9	42.9	34.8		33.1	34.6	33.3	
Africa	365	195	14 747	45 769	62	1 390	5 487	10 900	50
Percentage of world traffic	3.9	4.2	3.6	3.4		1.8	2.7	3.3	
Middle East	417	193	19 717	60 916	67	3 891	9 378	15 940	59
Percentage of world traffic	4.5	4.2	4.8	4.5		5.2	4.6	4.9	
Asia and Pacific	2 145	640	103 708	417 045	69	28 339	67 716	104 330	65
Percentage of world traffic	23.2	13.8	25.4	30.6		37.7	33.1	31.9	
North America	1 830	648	66 813	286 664	72	13 568	40 411	68 090	59
Percentage of world traffic	19.8	14.0	16.3	21.0		18.0	19.7	20.8	
Latin America and Caribbean	707	460	28 681	78 119	65	3 152	10 761	19 000	57
Percentage of world traffic	7.6	9.9	7.0	5.7		4.2	5.3	5.8	
Total	9 247	4 627	408 688	1 363 350	69	75 200	204 870	326 600	63

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 1996[1]
(commercial operators of ICAO Contracting States)

Type of aircraft	Before 1996	Delivered during 1996	Total as of 31/12/96	Ordered during 1996[2]	Remaining to be delivered as of 31/12/96[3]
TURBO-JETS					
Airbus Industrie A-300	446	13	459	10	23
Airbus Industrie A-310	247	2	249	—	9
Airbus Industrie A-319	—	18	18	57	120
Airbus Industrie A-320	515	38	553	126	260
Airbus Industrie A-321	38	16	54	37	141
Airbus Industrie A-330	40	10	50	42	113
Airbus Industrie A-340	63	27	90	26	85
Boeing 737	2 748	76	2 824	349	764
Boeing 747	1 056	26	1 082	66	161
Boeing 757	693	42	735	44	134
Boeing 767	595	44	639	12	86
Boeing 777	13	32	45	88	273
British Aerospace — 146/RJ 85/100	263	25	288	14	32
Canadair Regional Jet	91	52	143	60	51
Embraer EMB-145	—	2	2	27	43
Fokker 100	274	4	278	—	—
Fokker 70	27	13	40	7	7
McDonnell-Douglas MD-80/90	1 143	36	1 179	29	134
McDonnell-Douglas MD-95	—	—	—	—	50
McDonnell-Douglas MD-11	147	15	162	9	15
Total of aircraft in production	8 399	491	8 890	1 003	2 501
Total of aircraft not in production[4]	5 963	—	5 963	—	—
Total turbo-jets	14 362	491	14 853	1 003	2 501
TURBOPROPS					
Aerospatiale/Aeritalia ATR-42/72	449	39	488	24	21
British Aerospace ATP	55	—	55	—	—
British Aerospace Jet Stream 41	70	22	92	4	12
DeHavilland Canada DHC-8	409	38	447	71	71
Dornier DO-328	50	22	72	27	21
Embraer EMB-120 Brasilia	302	15	317	5	7
Fokker 50	199	4	203	3	9
SAAB SF-340	376	26	402	32	31
SAAB 2000	25	11	36	7	12
Total of aircraft in production	1 935	177	2 112	173	184
Total of aircraft not in production[4]	2 560	—	2 560	—	—
Total turboprops	4 495	177	4 672	173	184

1. The numbers given are estimated on the basis of information supplied by aircraft manufacturers. In many instances, numbers for the 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 1995.

Table A1-3. Aircraft accidents involving passenger fatalities on scheduled air services, 1977-1996

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 USSR up to 1992 and the Commonwealth of Independent States thereafter								
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[1]	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	1066	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[2]	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	0.22	0.09	0.15
1995	22	557	0.03	0.04	0.12	0.19	0.08	0.13
1996	22	1132	0.05	0.08	0.11	0.18	0.07	0.12
Including the USSR up to 1992 and the Commonwealth of Independent States thereafter								
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	653	0.04	0.06	na	na	na	na
1992	29	1097	0.06	0.09	na	na	na	na
1993	34	936	0.05	0.08	0.20	0.32	0.12	0.22
1994	28	941	0.04	0.07	0.15	0.25	0.10	0.16
1995	26	710	0.03	0.05	0.13	0.21	0.08	0.15
1996	23	1135	0.05	0.08	0.11	0.18	0.07	0.13

1. Includes one collision on the ground shown here as one accident.
2. 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
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	37	5	20	2	10	53	36
1995	14	2	9	0	3	3	0
1996	14	2	10	0	2	53	126

*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 1997, 1998 and 1999 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:

where:

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

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 37 years were

used in the subsequent econometric (least squares regression) analysis, with the following results at the global level.

$$ln\ PKP = 0.99 + 2.12\ ln\ GDP - 0.60\ ln\ PYIELD \qquad R^2 = 0.999$$
$$(32.8) \qquad (-8.1) \qquad S.E. = .024$$

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 charges for airports and air navigation services, 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.

5/98, E/P1/1900

Order No. CIR271
Printed in ICAO