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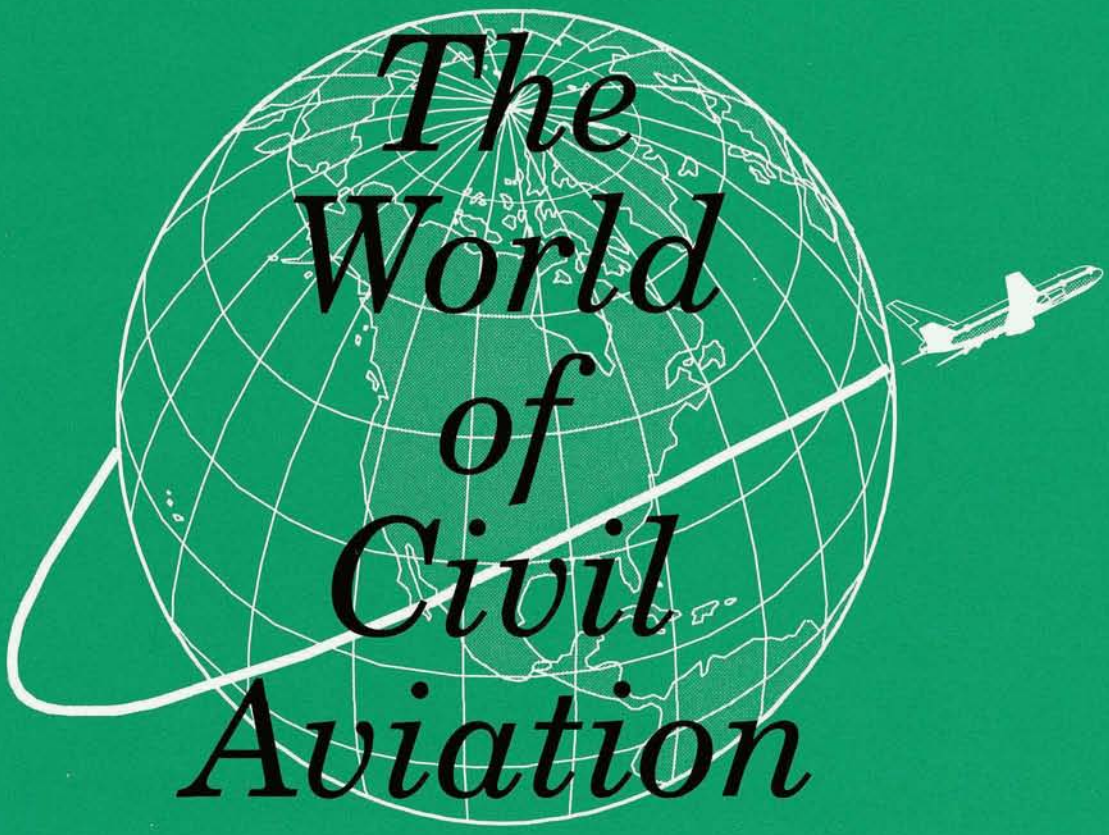

The World of Civil Aviation

2002–2005

Approved by the Secretary General and published under his authority

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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9/03

HIGHLIGHTS

DURING 2002 ...

The world economy continued its slow recovery …

The world's Gross Domestic Product (GDP) grew by an estimated 3 per cent in real terms. On a regional basis the change in GDP ranged from an estimated increase of 4.8 per cent for Asia/Pacific to no growth for Latin America and the Caribbean (Chapters 1, 5 and 6).

… as airline traffic performance was patchy...

Total scheduled passenger/freight/mail tonne-kilometres performed increased at a 1.6 per cent rate. Significant differences prevailed among regions with growth ranging from -4.8 per cent for carriers based in Africa to 12.6 per cent for those in the Middle East (albeit from a low base). After the steep 2001 decline, global passenger traffic grew at just 0.4 per cent (in terms of total passenger-kilometres performed), again masking differences among regions (Chapters 2, 5 and 6).

... and airline operating results continued to suffer…

Preliminary estimates indicate that the world's scheduled airlines suffered an aggregate operating loss of 2.3 per cent of their total operating revenues, following an operating loss of 3.8 per cent in 2001 (Chapters 2, 5 and 6).

… while aircraft orders were stalled.

A total of 497 turbo-jet powered aircraft were ordered, compared to 990 in 2001 and 1 553 in 2000. The financial commitment for these aircraft orders with major aircraft manufacturers is estimated at U.S.$40 billion in 2002, down from $69 billion and $80 billion the previous two years (Chapter 2).

Bilateral and regional developments supported liberalization of air transport services.

Bilateral agreements remained the primary vehicles for liberalization of international air transport services for most States, though now with a substantial overlay of regional and plurilateral liberalization arrangements (Chapter 2).

Privatization of airlines slowed...	Action taken towards privatization included five airlines achieving their goals, another four airlines announcing their objectives and some 40 State-owned carriers continuing preparation (Chapter 2).
...as airline alliances continued to expand.	Airlines continued to expand transnational strategic alliances to achieve enhanced market access and synergies (Chapter 2).
Low-cost carriers were challenging the full service network of major airlines and...	The traditional business model of the full service airline came under scrutiny, particularly for airlines with global reach, and spawned experimentation to remain competitive with low-cost carriers (Chapter 2).
...e-commerce development was transforming airline product distribution.	Airline distribution business and channels continued to be restructured. Rapid growth has been experienced in on-line sales of air transport services via the Internet, both through third-party providers and directly to consumers and other businesses (Chapter 2).
Airports and air navigation services providers incurred revenue losses ...	The slow recovery of air traffic placed financial constraints on airports and air navigation services providers (Chapter 3).
... and developed cooperative strategies…	Airports continued to pursue cooperative strategies or alliances among themselves (Chapter 3).
… while construction projects progressed.	Major airport expansion projects were underway in all regions with Europe, Asia and North America leading in airport projects completed, under construction or projected (Chapter 3).
Implementation of CNS/ATM systems components continued to yield early benefits.	Continued implementation of satellite-based communications, navigation and surveillance/air traffic management systems led to more efficient airspace utilization for international civil aviation. Air traffic service systems around the world continued to be upgraded as part of an evolving seamless global air traffic management system (Chapter 3).

Safety remained a top priority …

Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services worldwide shows 14 aircraft accidents in 2002 involving 791 passenger fatalities compared to 13 accidents involving 577 passenger fatalities in 2001. The number of passenger fatalities per 100 million passenger-kilometres increased from 0.020 in 2001 to 0.025 in 2002. By year-end, aviation administrations in 180 out of 188 ICAO Contracting States and five territories had been assessed through the ICAO Universal Safety Oversight Audit Programme (Chapter 4).

… and there was a greatly increased focus on security.

Twenty-two acts of unlawful interference were recorded in 2002, including two acts of unlawful seizure of aircraft, compared to seven in 2001, and eight facility attacks. The decrease in the number of unlawful seizures of aircraft could be attributed to enhanced global aviation security measures in place following the events of 11 September 2001 in the United States (Chapter 4).

A mechanism of war risk insurance for third-party liability was established.

The ICAO Council approved the establishment of an international mechanism of war risk insurance coverage for third-party liability (Chapter 4).

States continued to deal with environmental problems associated with aviation, including aircraft noise ...

European legislators adopted rules and procedures regarding the introduction of noise-related operating restrictions at community airports, taking into account the "balanced approach" to aircraft noise management adopted by the ICAO Assembly in 2001 (Chapter 4).

...and the impact of aircraft engine emissions.

Working through ICAO, developed countries continued to study policy options to limit or reduce greenhouse gas emissions from aviation, including both technical solutions and the application of market-based measures (Chapter 4).

BETWEEN 2003 AND 2005

Initially stagnant, recovery of airline traffic growth is expected ...

The growth of total scheduled passenger traffic (in terms of passenger-kilometres performed) is forecast to remain stagnant ("zero growth") in 2003, to rebound at a 4.4 per cent rate in 2004 and to continue to grow at 6.3 per cent in 2005 (Chapters 5 and 6).

... with recovery in airline finances taking longer.

The operating result — as a percentage of operating revenues (passengers, freight, mail and incidental revenues) — is forecast to remain negative at -2.1 per cent in 2003, then to improve progressively to reach break even by 2005 (Chapter 5 and 6).

Regional differences in passenger traffic growth will persist.

Scheduled passenger traffic of airlines based in Asia/ Pacific is foreseen to gain momentum after an anticipated decline in 2003 due to the effects of Severe Acute Respiratory Syndrome (SARS). Traffic of North American and European airlines is expected to stabilize in 2003 and to rebound starting in 2004. Passenger traffic of airlines based in Africa and the Middle East is expected to achieve relatively strong growth rates, while Latin American/Caribbean airlines are projected to grow moderately above the world average throughout the forecast period (Chapters 5 and 6).

Foreword

Introduction

1. This circular, *The World of Civil Aviation — 2002 to 2005,* is the eleventh in an annual series of publications covering recent and future developments in civil aviation; the developments for the years 2001 to 2004 were published in Circular 291. In the present circular, Part I reviews the main events in or affecting international civil aviation in 2002; Part II analyses trends in the world economy and the air transport industry and presents global forecasts of scheduled passenger traffic and basic airline financial trends through to 2005; and Part III reviews, on a region-by-region basis, the year 2002 and gives passenger traffic prospects through to 2005.

Sources

2. Extensive aviation statistics may be found in the various ICAO Digests of Statistics. In addition to these Digests, sources of information for *The World of Civil Aviation* include relevant and most recently available statistical publications of the United Nations (UN); BACK Aviation Solutions fleet and airline schedule databases; the Airports Council International (ACI); the Air Transport Association (ATA); Association of Asia Pacific Airlines (AAPA); the Association of European Airlines (AEA); Avmark Inc.; the International Air Transport Association (IATA); the International Monetary Fund (IMF); the Organisation for Economic Co-operation and Development (OECD); the United Nations Conference on Trade and Development (UNCTAD); the United States Department of Transportation (DOT); the World Bank (WB); the World Tourism Organization (WTO-OMT); the World Trade Organization (WTO-OMC); and the WEFA Group (formerly known as Wharton Econometrics Forecasting Associates).

3. Another source of information used for *The World of Civil Aviation* is 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.

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

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5. The statistical data for 2002 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 operational results where it may be considerably higher.

6. Unless otherwise noted:

a) all statistical data are applicable to ICAO Contracting States (188 at the end of 2002);

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

c) traffic statistics are for scheduled services of commercial air carriers;

d) total airline financial statistics relate to non-scheduled as well as scheduled operations of commercial air carriers;

e) the expression “tonne-kilometre” means metric tonne-kilometre;

f) the word “billion” means one thousand million; and

g) all references to monetary units made in this circular mean “United States (U.S.) cents” for “cents” and “U.S. dollars” for “$”.

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PART I

THE WORLD IN 2002

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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: demand for air transport is primarily determined by economic development. International trade in goods and services (including tourism) and other commercial activities generally have a direct impact on the demand for air travel and air freight. Development in personal income affects the level of purchasing power and the propensity to undertake leisure travel in general and air travel in particular. However, consumer confidence is influenced also by other factors because the air transport and tourism industries are very sensitive to safety and security concerns.

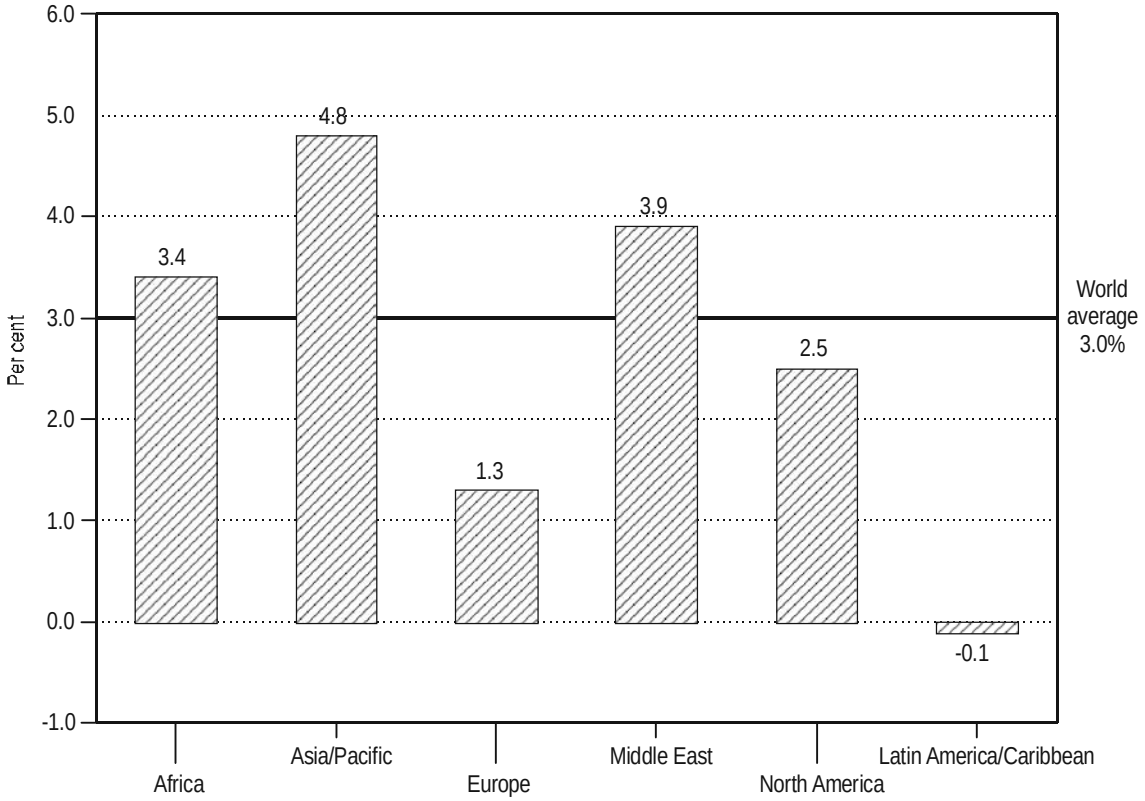
1.2 In 2002, the world economy began to recover from the sharp slowdown in 2001, with trade and industrial production improving across almost all major regions. The world gross domestic product (GDP) grew approximately 3 per cent in real terms. Much stimulus for that trend came from the North American economy while Europe saw weakened economic growth. The economic performance in the regions of Africa and the Middle East remained stable. The Asia/Pacific region regained some of its economic strength. In contrast, the economic performance of the Latin America and Caribbean region continued to weaken.

1.3 As background to the analysis of the world of civil aviation in 2002, which follows in Chapters 2 to 4, this chapter reviews global developments in 2002 concerning: economic output, trade, international tourism, inflation, currency markets, and crude oil and jet fuel prices. The impact of economic trends on the medium-term outlook for commercial air transport at the global and regional levels is discussed in Part II, World Outlook to 2005 (Chapter 5) and Part III, Regional Perspectives 2002–2005 (Chapter 6), respectively.

GROSS DOMESTIC PRODUCT

1.4 Global GDP grew in real terms by 3 per cent in 2002, compared to 2.3 per cent in 2001. This global result masks a wide spread between the economic performances of industrial and developing countries, and among regions. Figure 1-1 illustrates the economic growth rates for the world and ICAO statistical regions in 2002 (see also Table 5-1).

1.5 The economies of industrialized countries expanded at an estimated 1.8 per cent GDP growth rate in 2002, double that of the previous year but still at a low level compared to decade averages of 3 and 2.6 per cent for 1985-94 and 1995-2004, respectively, according to IMF data and estimates. Since industrialized countries produce more than half of the global output, their performance had an overall stimulating effect on the world economy. Much



Source: ICAO estimates based on data from the IMF, OECD, WEFA Group, World Bank and other sources.

Figure 1-1. Annual change in real GDP by region — World (2002/2001)

impulse in 2002 came from the North American economy which grew by 2.5 per cent, a substantial recovery from the slowdown (0.4 per cent) in 2001.

1.6 The European region achieved an average GDP growth of 1.3 per cent in 2002, to which the European Community (EC) contributed at a rate of 0.8 per cent. Economies of Central and Eastern European countries grew in the aggregate around 2.9 per cent while the Russian GDP grew stronger, at 4.3 per cent, yet at a slower pace than in the previous two years.

1.7 The economic performances of developing countries continued above the world average at a 4.6 per cent GDP growth rate in 2002 compared to 3.9 per cent in 2001. Africa's economic performance remained stable with GDP growth of 3.4 per cent. The regional economy with the largest share in the world economy, Asia and the Pacific, grew at 4.8 per cent, above the world average. The developing economies in Asia/Pacific contributed significantly as their aggregate GDP grew by 6.5 per cent, but this result masks vast differences among countries. China's GDP growth of 8 per cent continued to reflect a strong economic performance which was to a varying extent also experienced by several South-East

Asian economies. Asia's four newly industrialized economies recovered significantly, averaging 4.6 per cent GDP growth, following their sharp slowdown to 0.8 per cent growth in 2001. Japan's GDP grew for the second consecutive year at a very low level (0.3 per cent), while the economies of both Australia and New Zealand expanded their growth momentum to around 4 per cent.

1.8 In the Latin America and Caribbean region adverse factors remained in force; still affected by weakening demand from some major trading partners and a financial crisis in Argentina, the region's GDP growth contracted by 0.1 per cent. The Middle East region's economy grew by about 3.9 per cent, impacted by oil market developments and concerns about the security situation in the region.

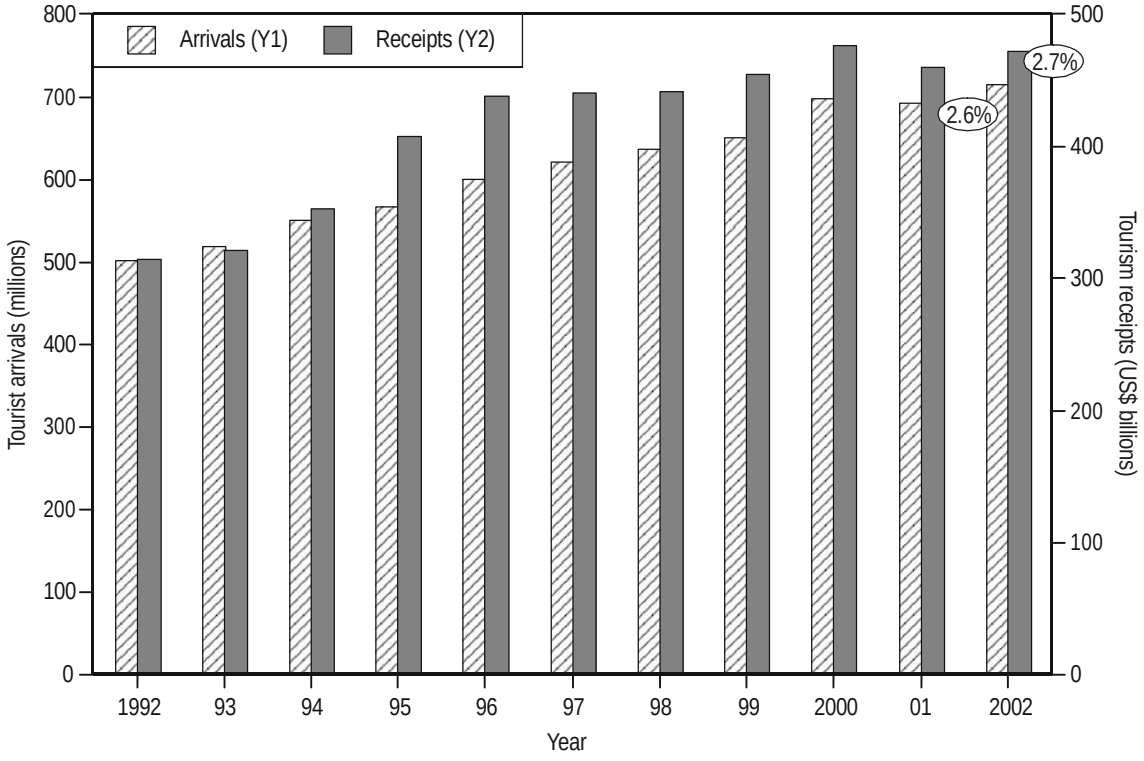
INTERNATIONAL TRADE AND TOURISM

1.9 International trade in goods and services improved (2.9 per cent) across almost all major regions in 2002 following the sharp economic slowdown in 2001 which caused world trade to almost stagnate (0.1 per cent) compared to 12.6 per cent growth in 2000, the highest rate achieved during the last decade. Industrialized economies started to recover both their export and import volumes (around 2 per cent), however, at a slower pace than developing countries (around 5 per cent).

1.10 Although internationally marketed services benefited from globalization of economic activities and gained importance in recent years, trading of goods still commanded an 80 per cent share of the value of world exports, amounting to $6 245 billion in 2002, according to the IMF. Overall trading of goods recovered slowly at 3.1 per cent. Export and import volumes of industrialized economies improved slowly at 1.9 and 2.3 per cent rates from their respective 1.8 per cent declines in 2001. By comparison, both export and import volumes of developing economies grew stronger at 5.5 and 5.7 per cent, respectively. Their export growth can be solemnly attributed to non-fuel products (7.7 per cent) given that fuel products lost 2 per cent of their 2001 trading volume. Imports of non-fuel products were up by 5.9 per cent, while 4.5 per cent more fuel products were imported in 2002 over 2001.

1.11 Demand for international air travel is significantly fueled by international tourism. According to preliminary WTO-OMT statistics, a world total of 714.4 million international tourist arrivals (ITAs) were reported in 2002, i.e. 18 million more tourists traveled internationally than the previous year, representing an increase of 2.6 per cent over 2001. As a result, foreign exchange earned in host countries, in terms of international tourist receipts (ITRs), rose from $459.8 billion in 2001 to $472 billion in 2002, an increase of 2.7 per cent. Figure 1-2 provides global results in international tourist arrivals and receipts from 1992 to 2002. The regional developments reported below reveal some of the major factors behind this recovery from the 2001 decline of 0.5 per cent for ITAs and 2.8 per cent for ITRs.

1.12 Regional tourism statistics for 2002 are presented in Table 1-1. These most recent developments show that Europe maintained the leading position in the global market, holding a 58 per cent share in terms of ITAs and a 51 per cent share in terms of ITRs. Since 2001 Asia/Pacific overtook the Americas for the second rank in terms of global ITAs while the



Source: WTO-OMT.

Figure 1-2. International tourist arrivals and receipts — World (1992–2002)

Americas maintained the second rank in terms of global ITRs (see Table 1-1). International arrivals in countries of the Americas fell by 4.3 per cent, mirroring economic problems that started well before 11 September 2001 and prevailed for inbound/outbound tourist origins/destinations, such as Argentina, Brazil and Japan. This continuous low demand also reflected the temporarily shattered consumer confidence of travelers to and from the United States. Inbound and outbound tourism to the U.S. had suffered since the 2001 terrorist attacks which had brought its ITAs down by 10 per cent in 2001 and by 6.7 per cent in 2002. U.S. tourism industries were partly compensated by stronger domestic demand which would in other regions with smaller States count as intra-regional demand. Other tourism destinations also depend heavily on travelers from North America. Mexico (–0.7 per cent) and the Caribbean (–5.6 per cent) continued to suffer from loss of business while Canada was less affected (1.8 per cent). South America (–12.1 per cent) suffered in addition from contracting intra-regional tourism; national ITAs vary considerably with Brazil (–7.2 per cent) and Cuba (–5 per cent) hit worse and Argentina (15.4 per cent) recovering. In contrast, Central American States enjoyed 6.4 per cent growth, albeit from a rather low base.

1.13 In the Asia/Pacific region 131.3 million foreign tourists were received in 2002, over 10 million or 8.4 per cent more than in 2001. Sub-regional statistics show the diverse tourism developments in that vast region. ITAs of South Asia were just 2.3 per cent higher; overall tourism demand remained weak. While some countries suffered from negative impacts of civil unrest (including India at –6.6 per cent) others bounced back (including the Islamic Republic

Table 1-1. Regional distribution of international tourist arrivals and receipts — 2002

	Total arrivals[1] (millions)	Market share 2002[2] (%)	Change 2002[1]/01 (%)	Rank 2002	Total receipts[1] (US$ billion)	Market share 2002[2] (%)	Change 2002[1]/01 (%)	Rank 2002
Africa	29.2	4.1	4.3	4 (3)	11.8	2.5	1.1	5 (5)
Americas	115.0	16.1	–4.3	3 (3)	113.3	24.0	–7.2	2 (2)
Asia/Pacific	131.3	18.4	8.4	2 (2)	94.7	20.1	8.0	3 (3)
Europe	414.4	58.0	2.3	1 (1)	240.1	50.9	6.0	1 (1)
Middle East	24.5	3.4	12.2	5 (4)	12.1	2.6	2.3	4 (4)
World	714.4	100.0	2.6		472.0	100.0	2.7	

1. Preliminary data as per July 2003, figures are rounded.
2. Calculations by ICAO.

Source: WTO-OMT.

of Iran at 17 per cent). There were still 4.9 per cent more international tourists traveling to South-East Asia; sub-regional growth in terms of ITAs stabilized through robust demand in Thailand (7.3 per cent) but was dampened by lost business in Indonesia (–2.2 per cent). North-East Asia saw a buoyant 12.2 per cent rise in ITAs with increases in China (+11 per cent) and its Special Administrative Regions of Hong Kong and Macao (20.7 and 12.4 per cent, respectively) as well as Japan (9.8 per cent).

1.14 In 2002, the Middle East rebounded strongly from an almost 4 per cent loss in 2001, reporting 12.2 per cent growth in ITAs (also from a rather low base) with Dubai (30 per cent), Lebanon (14.2 per cent), Egypt (12.6 per cent) and Jordan (9.7 per cent) benefitting significantly. Africa's ITAs grew by 4.3 per cent mainly due to a strong performance of South Africa and Ghana (10.9 and 9.9 per cent, respectively), Botswana, United Republic of Tanzania and Senegal (7.3, 6.8 and 5 per cent, respectively). However, individual North African countries, such as Tunisia (–6 per cent) and Morocco (–0.7 per cent), felt the unfavorable impacts of safety and security concerns on tourism, and their losses resulted in a negative sub-regional average (–2.4 per cent) for 2002.

INFLATION AND CURRENCY MARKETS

1.15 Since the early 1980s, consumer prices in industrial countries have increased at steadily declining levels despite sharp fluctuations in commodity prices, including oil. During 2002, inflation in most industrial countries increased moderately, resulting in an aggregate rate of 1.5 per cent for consumer prices, reduced from 2.2 per cent the previous year. In the

context of economic recovery, in the U.S., consumer prices increased by just 1.6 per cent in 2002, compared to 2.8 per cent in 2001. Europe's consumer prices rose almost at a similar rate during this period (2.3 per cent in 2002). In a climate of low domestic demand, Japan's consumers experienced declining prices for the fourth consecutive year (–0.9 per cent in 2002).

1.16 Consumer prices in developing countries as a group followed a similar trend, with an average inflation rate of 5.4 per cent in 2002. Large variations prevailed from region to region and among countries within regional groupings. Developing countries in Asia managed to keep consumer prices at low inflation levels as reflected in the regional average rate of 1.9 per cent in 2002. In Africa, inflation continued to stabilize, albeit with prices still rising at an aggregate rate of 9.3 per cent in 2002. In Latin America and the Caribbean, consumer prices stabilized below a 10 per cent increase for the fifth consecutive year (8.7 per cent in 2002). In the Middle East region, consumer prices were kept below the 20 per cent increase mark for the third consecutive year (16.4 per cent in 2002). For the countries-in-transition, the aggregate inflation rate continued to drop in 2002 to 11.1 per cent. Similarly, the Russian Federation experienced relative price stabilization with an increase of around 16 per cent in 2002. Central and Eastern European countries (excluding the CIS) continued to control the rise of their consumer prices and saw a 5.6 per cent increase in 2002.

1.17 Currency exchange rates responded to international differences in asset values, interest and inflation rates, trade balances and various speculative pressures in individual countries. Among the currencies of major industrial economies, the Japanese yen weakened further against the U.S. dollar in 2002. Depreciation of a number of Asian currencies in recent years contributed to a strengthening of the U.S. dollar against these currencies. At the same time, the common unit of the European exchange rate mechanism, called EURO, strengthened against the U.S. dollar, closely followed by the pound sterling. The monthly changes of these three currencies against the U.S. dollar, indexed over the two-year period 2001/2002, are illustrated in Figure 1-3.

1.18 Movements in exchange rates affect relative prices of international travel markets and hence the related demand and subsequent geographical distribution of traffic flows. Travel decisions are affected by exchange rates and price comparisons at different destinations. Differences in inflation rates for consumer prices and changes in exchange rates have at various times encouraged traffic in some markets and discouraged traffic in others.

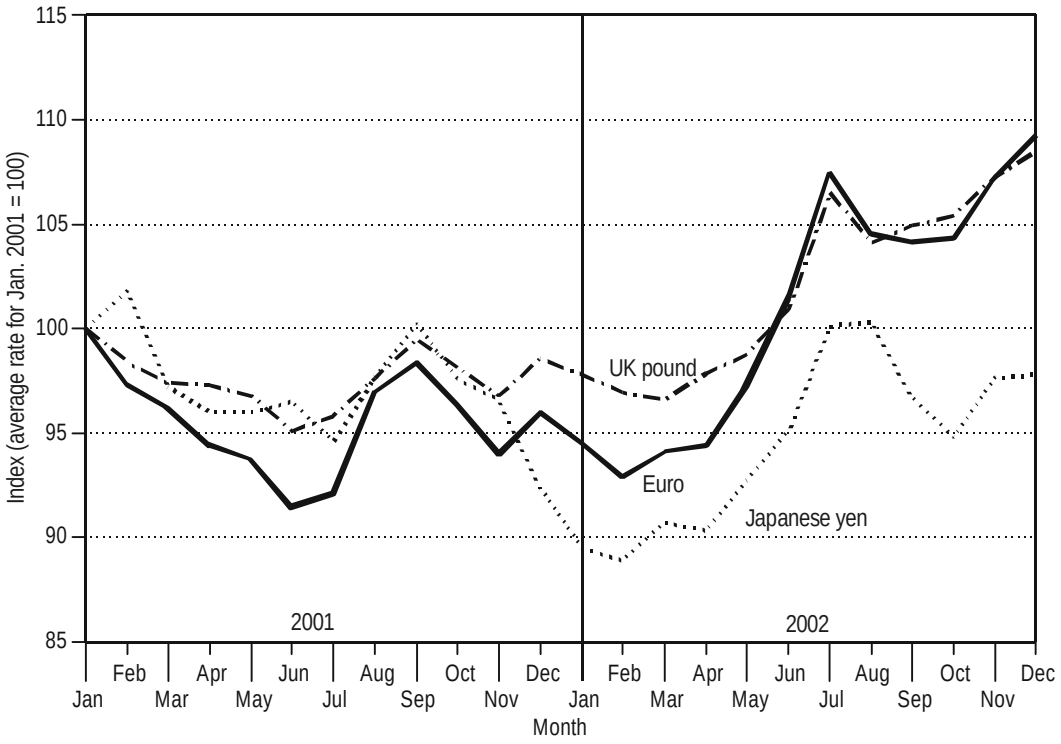
1.19 Fluctuations in exchange rates affect the profitability and balance sheet of an airline. If the proportion of an airline's expenses incurred in the foreign currency exceeds the proportion of its foreign currency revenues, then the devaluation of the local currency would tend to reduce the airlines' operating profit. On the other hand, there could be a benefit associated with that part of the airlines' debt denominated in a depreciated foreign currency. An appreciated foreign currency, however, would increase the debt burden.

CRUDE OIL AND JET FUEL

1.20 In the year 2002, world prices of crude oil started from a low level following falling production and commodity prices which had plummeted after 11 September 2001. Oil prices

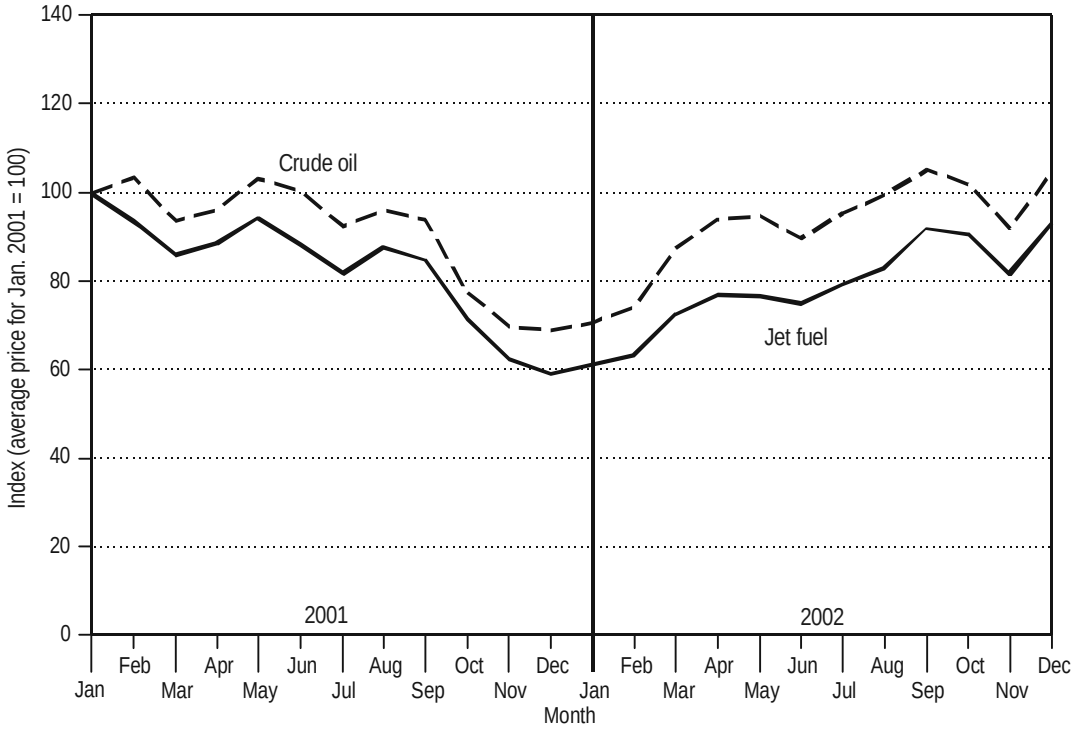
soared to as high as $33 per barrel towards the end of 2000, then fell to as low as $19 at the end of the year 2001 and recovered to $29 by December 2002. The monthly changes of world trade prices for crude oil, indexed over the two-year period 2001/2002, are illustrated in Figure 1-4.

1.21 Jet fuel prices did not react directly in line with crude oil prices but remained low due to weakened demand. The average annual price of jet fuel in U.S. dollars dropped from about 85 cents per gallon in 2000 to 72 cents per gallon in 2001 and 69 cents in 2002, easing the pressure on airline operating costs. Over the past decade, costs for fuel and oil have ranged from 10 to 15 per cent of operating costs of scheduled airlines.



Source: IATA five-day rate.

Figure 1-3. Currency variations with respect to the U.S. dollar (January 2001 to December 2002)



Source: Petroleum Economist and *The Journal of Commerce*.

Figure 1-4. Trends in crude oil and jet fuel prices (January 2001 to December 2002)

Chapter 2
Air Carriers and their Fleets

2.1 This chapter reviews developments in 2002 regarding economic regulation of air transport services as well as ownership, alliances and cooperation among air carriers. It further covers the fares and rates they offer, their product distribution, traffic, fleets, finances and personnel.

ECONOMIC REGULATION

Bilateral agreements and negotiations

2.2 During the year, a total of 91 bilateral air services agreements were reportedly concluded or amended by 69 States. Of these States, Canada, China, Hong Kong Special Administrative Region (SAR) of China, India, Japan, Malaysia, Qatar, Republic of Korea, Singapore and the United States each concluded or amended five or more agreements. Continuing a trend, over 70 per cent of these agreements and amendments contained some form of liberalized regulatory arrangements such as unrestricted traffic rights (covering Third, Fourth and in some cases Fifth Freedom rights), multiple designation with or without route limitations, free determination of capacity, a double disapproval or country-of-origin tariff regime, and broadened criteria of air carrier ownership and control.

2.3 One notable development is the continued increase in the number of "open skies" agreements, which provide for full market access without restrictions on designations, route rights, capacity, frequencies, codesharing and tariffs. During 2002, six "open skies" agreements were concluded among 10 States. Since 1992, over 85 "open skies" bilateral agreements have been concluded, involving approximately 70 States, with the United States being one of the partners in 59 cases (see Table A1-1). These agreements involve not only developed countries but also an increasing number of developing countries (involved in about 60 per cent of the agreements). In addition to the basic market access elements, about 50 agreements also grant "Seventh Freedom" rights for all-cargo services (four agreements also grant this right for passenger services). Twenty-one of the "open skies" agreements concluded by the United States have a transition annex that places limits on or provides for the phase-in of, inter alia, frequencies, Fifth Freedom rights, "Seventh Freedom" rights for all-cargo, third-country codesharing, charter services and ground handling, some of which are applied only to U.S. carriers.

2.4 Some bilateral negotiations have not been easy. For example, the seven-year-long "open skies" negotiations between the United States and the United Kingdom were

deadlocked early in 2002 because American Airlines and British Airways did not accept conditions imposed by the U.S. Department of Transport (DOT) to an approval of their proposed alliance. The United States declined to consider a "mini-deal" package proposed by the United Kingdom in August, although informal talks continued. In August, Colombia suspended the existing bilateral arrangement with Panama, which wanted a new "open skies" agreement; an interim deal was concluded in September to enable restoration of air services between the two States.

Regional regulatory developments

2.5 Some agreements negotiated in recent years have sought to liberalize air transport services on a regional or sub-regional basis or among a group of like-minded States. These regional and/or plurilateral liberalization arrangements have the basic objective of providing greater market access and improving services among the Member States concerned. Small groups of States of comparable size and development would find it easier to agree on market access than larger, diverse groups of States. The small groups would also provide a more manageable environment to test liberalized air transport policies. As shown in Table 2-1, there were at least 11 such regional or plurilateral arrangements with several other potential arrangements in the pipeline.

2.6 The year 2002 saw six noteworthy regional developments. First, 14 Member States of the Pacific Islands Forum concluded in October the negotiations of the Pacific Islands Air Services Agreement, which would progressively create a single aviation market in the sub-region after formal endorsement by the Member States. Second, Peru and Samoa joined, in May and November respectively, the Multilateral Agreement on the Liberalization of International Air Transportation known as the "Kona" agreement, a plurilateral "open skies" agreement, which had been signed originally by five Members of the Asia Pacific Economic Cooperation Forum (APEC) in 2001. Third, 10 Member States of the Association of Southeast Asian Nations (ASEAN) signed in September the ASEAN Memorandum of Understanding on Air Freight Services, which allows the designated airlines of each Member State to operate all-cargo services up to 100 tonnes weekly with no limitations on frequency and/or aircraft type, as a first step in the full liberalization of air freight services. Fourth, CLMV States (Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam) developed a draft Multilateral Agreement on Air Transport in the CLMV sub-region, which will be considered for adoption in 2003 to formalize a 1998 arrangement. Fifth, a series of bilateral agreements between Member States of the European Union (EU) on the one hand and Switzerland on the other officially came into force in July after completion of the ratification process by all Member States; the agreements, one of which covers air transport, integrated Switzerland into the European Economic Area (EEA). Sixth, the Council of the EU completed in December the enlargement negotiations with 10 Central and Eastern European States, which would bring them into the EU in 2004.

2.7 Within the EU, there was a significant development affecting a common foreign EU policy. In November, the European Court of Justice ruled on several cases brought in 1998 by the European Commission against eight Member States, which had concluded or amended bilateral air services agreements with the United States (seven of them "open skies"

Table 2-1. Regional/plurilateral agreements and arrangements

Region / Agreement	Year	Member States
Regional		
European Union (EU)/ European Economic Area (EEA)	1987 (First package); 1990 (Second package); 1993 (Third package with full implementation in 1997)	Austria (joined in 1995), Belgium, Denmark, Finland (joined in 1995), France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden (joined in 1995) and the United Kingdom; Iceland, Liechtenstein and Norway belonging to the EEA (entry into force in 1994); Switzerland (bilateral agreement, entry into force in 2002)
Andean Pact	1991	Bolivia, Colombia, Ecuador, Peru (suspended from 1992 to 1997) and Venezuela
Caribbean Community (CARICOM)	1996 (entry into force in 1998)	Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti (joined in 2002), Jamaica, Monserrat, St. Kitts and Nevis, St. Lucia, St. Vincent & Grenadines, Suriname and Trinidad and Tobago
Banjul Accord	1997	Cape Verde, Gambia, Ghana, Guinea-Bissau, Nigeria and Sierra Leone
Fortaleza Agreement	1997	Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay
CLMV Agreement	1998	Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam
Arab Civil Aviation Commission (ACAC)	1999	Bahrain, Egypt, Iraq, Jordan, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen
Economic and Monetary Community of Central Africa (CEMAC)	1999	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon
Common Market for Eastern and Southern Africa (COMESA)	1999	Angola, Burundi, Comoros, Congo (Democratic Republic), Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, United Republic of Tanzania (withdrew in 2000), Zambia and Zimbabwe
Yamoussoukro II Ministerial Decision	1999 (entry into force in 2000)	53 African Union (formerly OAU) States

Region / Agreement	Year	Member States
Plurilateral		
Multilateral Agreement on the Liberalization of International Air Transportation (MALIT, "Kona" agreement)	2001	Brunei Darussalam, Chile (signed in 2001, joined in 2002), New Zealand, Peru (joined in 2002), Samoa (joined in 2002), Singapore and the United States; Brunei Darussalam, New Zealand and Singapore were also the parties to the Protocol in 2001
Sub-regional		
IMT-Growth Triangle	1999	A part of regions in Indonesia, Malaysia and Thailand
BIMP-East ASEAN Growth Area	1999	A part of regions in Brunei Darussalam, Indonesia, Malaysia and Philippines

Source: Texts of the Agreements and aviation press.

agreements). The judgements affirmed the ability of the Member States to enter into bilateral agreements with third countries to the extent that these do not affect European Community rules on air transport, but found that some of the provisions in these bilateral agreements infringed the European Community's exclusive external competence as regards air fares and computer reservation system (CRS) services. The Court also found that clauses regarding national ownership and control of airlines infringed European Community law on Community-wide freedom of establishment. Following the Court's judgement, the Commission indicated it would request the European Council to issue urgently a mandate for the Commission to open negotiations for a Community-wide air services agreement with the United States, as well as for similar agreements with Japan and the Russian Federation.

Trade in services developments

2.8 At the multilateral level, the General Agreement on Trade in Services (GATS) has had some limited influence on air transport services since 1995. The GATS provides a multilateral regulatory framework for the liberalization and expansion of trade in all service sectors under such trade principles as most-favoured nation and transparency. Currently, the GATS Annex on Air Transport Services covers three so-called soft" rights, namely aircraft repair and maintenance, selling and marketing of air transport, and CRS services.

2.9 In 2002, the WTO-OMC continued its mandated review of the Air Transport Annex, which started in 2000. At the fourth session of the review, in March, views in the Council for Trade in Services (CTS), which oversees the operation of the GATS, were divided as to the continuation of the review and the possible expansion of the coverage. The CTS discussed a proposal for Members to make more substantial commitments on aircraft repair and

maintenance, as well as to strengthen existing commitments in view of the importance and potential that this holds for developing countries. The CTS also suggested the participation of the WTO-OMC at ICAO's Fifth Worldwide Air Transport Conference in March 2003. With respect to the date of the next review, the CTS envisaged holding a session following the Conference so as to address the implications and the relevance it might have for the Air Transport Annex.

2.10 Separately, the OECD completed a three-year examination of the liberalization of air cargo services in January. The OECD Secretariat subsequently published a Bilateral Protocol to be used with existing air service agreements, which focuses on the liberalization of traffic rights for air cargo services, ancillary services and other specific air cargo transportation issues that can be dealt with separately under existing bilateral air services agreements. A draft Multilateral Agreement was also published to provide a means for liberalization of existing market restrictions and restrictions on commercial flexibility and "doing business" matters on a multilateral basis.

National liberalization policies

2.11 Several States launched a review process of their overall air transport policies, which was considered necessary in light of the global trend toward increased liberalization. Some of these policies seek to liberalize air transport services, in whole or in part, on a unilateral basis without requiring comparable rights from bilateral partners in return. Others aim at liberalizing domestic air transport markets and also at permitting more carriers to fly international routes.

2.12 In 2002, major policy developments were reported as follows. In May, the Government of Canada announced a new multiple designation policy for international scheduled air services, which removed restrictions on the number of Canadian carriers designated to serve foreign markets whenever multiple designation was possible. In July, the Government of Mozambique announced that it would lift the monopoly status granted to LAM Mozambique Airlines, allowing other smaller carriers to operate internationally. Also in July, the Government of Sri Lanka announced its intention to pursue an "open skies" policy designed to encourage foreign airlines to serve the country. In November, the Government of India announced an experimental "open skies" policy for four months between December 2002 and March 2003. During this period, airlines would be allowed to increase their frequency or capacities from the destinations already being served; this unilateral offer was restricted to airlines from the United States and Europe.

Fair competition

2.13 As liberalization spreads, the question of how to maintain fair competition in international air transport is increasingly becoming an issue. One indication is the more frequent use of competition laws in dealing with anti-competitive behaviours, which may range from predatory practices against a specific competitor on a particular route to monopolistic activities serving to strengthen existing market power. However, one of the

fundamental problems is how to distinguish between unfair and normal competitive behaviours, and reliance has increasingly been placed on analyses and development of standards through a case-by-case approach.

2.14 In the regulatory area, one notable development in 2002 was that States belonging to the Common Market of Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC) and the East African Community (EAC) jointly developed a comprehensive set of competition rules specifically for the air transport sector for common application to these sub-regions. Another development was a proposed regulation by the European Commission on protection of Community airlines against subsidization and unfair pricing practices from third-country airlines; this would permit the Commission to impose duties on third-country airlines benefiting from State aids/subsidies, including non-commercial advantages.

2.15 Major competition cases in 2002 (except those related to mergers, alliances and State aids, which are covered separately) were as follows. In February, Germany's competition authorities accused Lufthansa of predatory pricing against the new entrant Germania on the Frankfurt - Berlin route and prescribed certain minimum fares to be charged by Lufthansa; in April, it imposed a fine on Lufthansa for refusal to grant slots at attractive times of day to Germania in accordance with the conditions to clear the Lufthansa — Eurowings merger. Both cases were subsequently appealed by Lufthansa. In May, the Australian Competition and Consumer Commission (ACCC) instituted legal proceedings against Qantas, alleging that the carrier had misused its market power on the Brisbane — Adelaide route after Virgin Blue's entry in 2000. In July, Italy's competition authorities fined Alitalia for granting special incentives to travel agents in an effort to establish customer loyalty, following a similar ruling in the previous year; in August, it again fined Alitalia, along with five smaller carriers, for simultaneous introduction of fuel surcharges on domestic routes, which was regarded as an illicit agreement.

State aid

2.16 State aid and assistance may take various forms. These include provision of capital, loans or guarantees by the State or by public institutions for national airlines having financial difficulties and seeking additional resources. In addition, many States have provided assistance to their national airlines through less direct methods such as preferential tax status, discounts on charges for airport services, and "buy national" policy (exclusive military and government contracts or travel purchasing policy). Some bankruptcy codes also contain generous provisions (for example, exemption from interest and pension fund payment), which act as an indirect form of State assistance for financially-troubled airlines.

2.17 In 2002, many States continued to provide State aid to their national airlines facing financial difficulties caused mainly by the economic slowdown and the impact of the events of 11 September 2001. For example, the Brazilian Government approved in September a comprehensive aid package for Brazilian carriers which included a provision for $320 million in tax relief. The European Commission approved in June the Italian Government's plan for a $1.43 billion capital increase for Alitalia, which was partly underwritten by the private

sector, while the Commission decided in December that the Greek Government must recover, inter alia, part of the aid previously granted to Olympic Airways since the carrier did not implement the restructuring plan linked to aid approval. The United States Government provided over 400 U.S. carriers with about $4.6 billion in direct financial compensation for losses incurred due to the events of 11 September 2001. In addition, the U.S. Air Transportation Stabilization Board (ATSB) received applications for a federal loan guarantee under the Air Transportation Safety and System Stabilization Act from 16 carriers. It has approved so far six applications (America West Airlines, US Airways, American Trans Air, Aloha Airlines, Frontier Airlines and Evergreen International Airlines), while rejecting eight applications including one by United Airlines. Chapter 11 of the U.S. Bankruptcy Code was also invoked to provide relief to Vanguard Airlines, US Airways and United Airlines, which filed for protection under its provisions.

Consumer protection

2.18 While contract terms and conditions for transporting passengers have traditionally been developed by airlines, a number of States have adopted some regulatory measures that address consumer interest issues. Denied boarding compensation, bans on smoking, on-time performance statistics and access for incapacitated passengers are a few examples. In addition, the Warsaw Convention liability system deals with the liability of air carriers in the case of accidents, loss of baggage and delays. In spite of this legal framework, the quality of service offered by airlines has not always met consumers' expectations. With the continuing liberalization of air transport regulation, the protection and improvement of airline passenger rights have achieved greater importance, particularly, but not exclusively, in major markets.

2.19 In Europe, the year 2002 saw three developments. First, two voluntary codes, namely the Airline Passenger Service Commitment and the Airport Voluntary Commitment on Air Passenger Service, became effective in February. Second, in June the European Commission started a consultation process about airline contracts including conditions of carriage focussing in particular on the industry standards. Third, in response to the European Parliament's amended proposal, in December the Commission revised its proposed regulation establishing common rules on compensation and assistance to passengers when facing denied boarding, cancellation of their flight or a long delay. However, the Commission rejected the Parliament's proposal for a reduction in compensation amounts and limited application to flight-only bookings. In the United States, the DOT modified in November certain reporting requirements on the service quality performance of airlines in order to collect data on the causes of flight delays and cancellations, which would be publicized monthly.

Airport access

2.20 The growth in commercial air services has continued to outstrip the available capacity at more and more airports. Because of the interconnected operations of the international air transport system, capacity constraints at some airports impact on other airports. Environmental, economic, political and physical constraints on airport capacity have, in some instances, exacerbated this problem. Governments, airlines and airports have each

developed measures to overcome or ameliorate situations of insufficient airport capacity. However, governments are increasingly likely to face situations where the demand by airlines to initiate or increase commercial operations cannot be met because of a lack of airport capacity.

2.21 In Europe, the reduction in traffic volume which took place after the events of 11 September 2001 had a significant impact on infrastructure congestion. According to the AEA delays of intra-European departures exceeding 15 minutes showed some improvements, affecting 19.9 per cent of departures, compared with 24.2 per cent in 2001. In June, the European Commission extended by a further year until June 2005 the block exemption from certain aspects of competition law requirements for slot allocation and airport scheduling. In November, in response to amendments adopted by the European Parliament, the Commission issued a revised proposal (originally issued in 2001) to amend its existing regulation on the common rules for the allocation of slots at Community airports. The Commission accepted amendments regarding the definition of new entrant, slot allocation criteria, and function of airport coordinator, but rejected more extensive derogations for a "use it or lose it" principle and increased flexibility for designation of coordinated airports.

2.22 In the United States, airport congestion at formerly busy airports has decreased since 11 September 2001. In March and April, the U.S. Federal Aviation Administration (FAA) and the DOT resumed two proceedings which had been suspended indefinitely in the autumn 2001, namely, a) on alternative policy options for managing capacity and mitigating congestion and delay at New York's LaGuardia Airport, and b) on the possible role, feasibility and effectiveness of using market-based solutions, including the use of auctions, peak-period fees, or "flat" fees, to relieve airport congestion and delay. The U.S. Department of Justice (DOJ) submitted in June its comments on the first proceeding, urging the FAA to rely to the maximum extent possible on market-based solutions and supporting the adoption of an auction mechanism for allocating capacity at LaGuardia Airport.

OWNERSHIP, ALLIANCES AND COOPERATION

Privatization

2.23 Privatization with respect to airlines is a term that is often loosely applied. It tends to be more of a process than a quantifiable objective or result. The process is one of divestment, by various methods, of State-owned or -controlled equity and may be carried out in a phased manner over time. Some States may consider a minor sale of shares as privatization. Subject to this use of the term, the privatization of State-owned airlines has been one of the preeminent transformations in international air transport, where airlines in all but a handful of States had been State-owned until recent times. The motives for privatization have been highly diverse, ranging from purely economic considerations, to improving operating efficiency and competitiveness, to a more pragmatic desire to reduce the heavy financial burden for States for financing capital investment in new equipment. Whatever the reasons, the privatization of airlines has accompanied a more commercially-

oriented outlook within an increasingly competitive environment. Since 1985, about 130 States have announced privatization plans or expressed their intentions of privatization for approximately 190 State-owned airlines. During this period, about 90 of these targeted carriers have achieved privatization goals.

2.24 In 2002, the trend towards partial or full privatization of State-owned airlines continued, but at a slower speed. As shown in Table 2-2, only five carriers achieved privatization aims, namely Air Tanzania, Arkhangelsk Airlines, and three Chinese carriers

Table 2-2. State-owned airlines targeted for partial or full privatization — 2002

Announced during 2002	Announced before 2002 and progress reported	Aim achieved during 2002
Baikal Airlines	Aer Lingus (delayed)	Air Tanzania
Chitaavia	Aeromexico/CINTRA (delayed)	Arkhangelsk Airlines
KMV Kavkazskie Mineralnye Vody	Air China	China Postal Airlines
Voronezhavia	Air France	Shanghai Airlines
	Air India (delayed)	Sichuan Airlnes
	Air Malawi	
	Air Namibia	
	Air New Zealand	
	Biman Bangladesh (delayed)	
	China Southern Airlines	
	El Al Israel Airlines	
	Garuda	
	Ghana Airways	
	Hemus Air	
	Iberia	
	Indian Airlines (delayed)	
	Iran Air	
	LAM Mozambique Airlines	
	Lineas Aerea del Ecuador (TAME)	
	Lithuanian Airlines	
	Malaysian Airlines	
	Malev	
	Merpati Nusantara Airlines	
	Mexicana/CINTRA (delayed)	
	Nigeria Airways	
	Olympic Airways	
	Philippine Airlines	
	Royal Jordanian (delayed)	
	Royal Nepal Airlines	
	Saudi Arabia Airlines	
	Siberia Airlines	
	Singapore Airlines	
	South African Airways	
	TAP Air Portugal	
	Thai Airways International (delayed)	

Source: Aviation press.

(China Postal Airlines, Shanghai Airlines and Sichuan Airlines). The Government of the United Republic of Tanzania sold 49 per cent of Air Tanzania to South African Airways in December, while keeping a 51 per cent stake. Russia's Arkhangelsk Airlines was fully privatized in mid-2002. China Postal Bureau sold a 49 per cent stake in China Postal Airlines to a parent company of China Southern Airlines in June, while keeping a 51 per cent stake. The Shanghai City Government reduced its stake in Shanghai Airlines from 75 per cent to about 40 per cent as a result of an initial public offering for domestic investors in September. An arm of the Sichuan Provincial Government reduced its stake in Sichuan Airlines from 100 per cent to 40 per cent in October by establishing a joint holding company with, inter alia, China Southern Airlines, Shandong Airlines and Shanghai Airlines.

2.25 In addition, another 40 State-owned carriers were reported to be in various stages of preparation for partial or full privatization. However, achievement of privatization has not been easy. Many of the initial privatization plans had to be deferred or postponed because of the complexities encountered in the process or the economic condition of the airlines concerned, or local circumstances, though in most cases the intention to privatize remains. The uncertainties surrounding the privatization process are also illustrated by a small counter trend of renewal, usually as a temporary measure, of State ownership as a national interest response to the potential demise of a national airline. For example, South Africa's state-owned company, Transnet, increased in February its shareholding in South African Airways from 75 per cent to 95 per cent by a buy-back from bankrupted Swissair's parent company, which had acquired a 20 per cent stake in 1999. In May, the Government of the Russian Federation strengthened its management control of Aeroflot without increasing its 51 per cent shareholding. In August, the Government of Italy increased its stake in Alitalia from 53 per cent to 62.4 per cent by subscribing a part of share capital increase.

National consolidation

2.26 Airlines in many parts of the world continued the pursuit of enhanced market strength through mergers, acquisitions or operational integration under a single holding company. The common thread of this trend is the continuing development of growth strategies designed to hold and expand existing market shares, gain access to new markets, achieve unit cost reduction, shield against fierce competition, and increase the scale of operations in order to attain a critical market position. While mergers or acquisitions are easier to achieve within the same country, some Governments have expressed concerns regarding the industry consolidation and have scrutinized it with great caution.

2.27 The year 2002 saw a relatively smaller number of mergers, many of which were announced in previous years. In March, the proposed merger of Aloha Airlines and Hawaiian Airlines was abandoned after a three-month negotiation. In May, Avianca, ACES and SAM Colombia started integrated operations under a holding company named Alianza Summa, which had been approved by the Colombian competition authorities in 2001. In August, easyJet, one of the largest European low-cost carriers, completed a merger deal with Go, another low-cost carrier in the United Kingdom. In October, Japan Airlines and Japan Air System created a joint holding company named Japan Airlines System, which was approved by Japan's Fair Trading Committee in April after the carriers agreed to conditions in terms

of slots at Tokyo's Haneda Airport and of domestic fares. In the same month, three Chinese airline groups headed by Air China, China Eastern Airlines and China Southern Airlines were officially launched through mergers with other smaller State-owned airlines in accordance with the final consolidation plan of the Civil Aviation Administration of China (CAAC). Air China was merged with China Southwest Airlines and China National Aviation Company to form the China National Aviation Holding Company. A parent company of China Eastern Airlines was merged with China Northwest Airlines and Yunnan Airlines as China Eastern Aviation Holding Company, and a parent company of China Southern Airlines took over China Northern Airlines and Xinjiang Airlines under China Southern Aviation Holding Company. Together, these three groups account for more than 80 per cent of China's domestic market.

Transnational ownership

2.28 The opportunity for equity investment in foreign carriers increased as many States adopted a new policy or amended existing rules on foreign investment or control in national airlines and relaxed air carrier ownership and control conditions in air services agreements. Most attempts to initiate transactions involving a foreign majority ownership, including cross-border mergers or acquisitions, however, were abandoned owing to the aero-political, economic and regulatory complexity. Even in the successful cases, the control and management of foreign carriers was not financially risk-free. Because of these difficulties in successful implementation, most foreign investments in the airline industry have been made on a limited scale, instead of taking a majority stake or pursuing a full-scale merger, and often as part of a strategy to forge or strengthen alliances and expand market access. Nevertheless, foreign investments have sometimes been short-lived. At the end of 2002, over 60 airlines had shareholdings in foreign airlines while about 220 airlines had equity owned by foreign investors in various degrees.

2.29 In 2002, the scale of new or expanded equity investments in foreign airlines was relatively small compared to previous years. The major transactions (except ones related to privatization) were, inter alia, an acquisition of a 30 per cent stake in Air Hong Kong, Cathay Pacific's wholly-owned subsidiary, by DHL Worldwide Express in October; an increase of Lufthansa's stake in bmi British Midland to 30 per cent (less one share) by acquiring 10 per cent from the BBW Partnership in November; and an acquisition of a 70 per cent stake in Armavia, a private Armenian carrier, by Siberia Airlines in November. Additionally, Qantas announced in November that it would acquire a maximum 22.5 per cent stake in Air New Zealand to form a trans-Tasman alliance, and as a first step subscribed to redeemable convertible notes (a 4.99 per cent stake once converted to equity) in December. By contrast, several airlines reduced their shareholdings in foreign carriers. For example, bankrupted Swissair's parent company divested its 49.8 per cent stake in Volare Airlines and Air Europe in February. British Airways' shareholding in Qantas was reduced from 21.4 per cent to 18.9 per cent in August as a result of British Airway's non-participation in Qantas's capital rising. Aer Lingus's 85 per cent stake in Futura, a Spanish charter carrier, was reduced to 20 per cent by selling to the latter carrier's management consortium in November.

2.30 Another significant development in 2002 was the turbulence surrounding multinational airlines. The debt-ridden Air Afrique, in which 11 Western and Central African States owned an approximate 70 per cent stake, filed for bankruptcy in February due to the failure to reach agreement on a bailout package backed by Air France. In April, the commercial court of Abidjan announced the liquidation of Air Afrique. Gulf Air, which also faced severe financial problems, was saved by emergency aid from three of four owner States, Abu Dhabi, Bahrain and Oman; however, Qatar announced in May its intention to withdraw from the treaty establishing Gulf Air and subsequently divested its 25 per cent stake. As a result, Qatar's stake was divided by the three remaining States, each of which increased its shareholding from 25 per cent to 33.3 per cent.

Alliances and cooperation

2.31 A relatively recent and rapidly evolving global phenomenon is the formation by airlines of alliances, i.e. voluntary unions of airlines held together by various commercial cooperative arrangements. There are now over 600 such alliance agreements in the world which contain a variety of elements such as codesharing, blocked space, cooperation in marketing, pricing, inventory control and frequent flyer programmes (FFPs), coordination in scheduling, sharing of offices and airport facilities, joint ventures and franchising. Intermodal alliances with railways have also grown in Europe and North America. The steady expansion of transnational alliances for strategic purposes and to achieve market access and synergies are a consequence of air carriers' response to, inter alia, perceived regulatory constraints (for example, bilateral restrictions on market access, ownership and control), a need to reduce their costs through economies of scope and scale, and a more globalized and increasingly competitive environment.

2.32 While numerous agreements concern cooperation on a limited scale (for example, codesharing on certain routes), the number of wide ranging strategic alliances has been on the rise. Most notable was the emergence of several competing "global alliance" groupings. As shown in Table 2-3, there are currently four global alliances, namely Star Alliance, oneworld, SkyTeam and Wings. Each group is composed of some major airline members having different geographical coverage with fairly extensive networks. Through the alliances, these carriers have combined their route networks, which extend to most parts of the world, and carry together over 50 per cent of worldwide scheduled passenger traffic.

2.33 Airline alliances are widespread but still evolving, with partnership relations becoming more intertwined and complex. In February, Swissair-led Qualiflyer terminated all the collaborative activities except its joint FFP, which also disbanded at the end of December. In June, Star Alliance announced that Asiana Airlines, LOT Polish Airlines and Spanair will join the group in 2003. In July, the cargo alliance named WOW, which was launched by three Star Alliance carriers (Lufthansa Cargo, SAS Cargo and Singapore Airlines Cargo) in 2000, gained Japan Airlines Cargo, whose passenger business has a close relationship with oneworld members. In July, United Airlines and US Airways announced a comprehensive marketing agreement including codesharing, following the failure of a merger plan in 2001. Continental Airlines, Delta Air Lines and Northwest Airlines announced in August a similar

Table 2-3. Global alliances

Alliance	Date	Members
Star Alliance	May 1997	Founded by Air Canada, Lufthansa, SAS, Thai Airways International, and United Airlines; subsequently joined by Varig (October 1997), Ansett Australia (March 1999), Air New Zealand (March 1999), All Nippon Airways (October 1999), Austrian Airlines Group (Austrian Airlines, Lauda Air and Tyrolean Airways, March 2000), Singapore Airlines (April 2000), bmi British Midland (July 2000) and Mexicana (July 2000); Asiana Airlines, LOT Polish Airlines and Spanair will join in 2003
oneworld	September 1998	Founded by American Airlines, British Airways, Canadian Airlines (withdrawn in June 2000), Cathay Pacific and Qantas; subsequently joined by Iberia (September 1999), Finnair (September 1999), LanChile (June 2000), and Aer Lingus (June 2000)
SkyTeam	June 2000	Founded by AeroMexico, Air France, Delta Air Lines and Korean Air; subsequently joined by CSA Czech Airlines (April 2001) and Alitalia (July 2001)
Wings	—	Founded by KLM and Northwest Airlines in 1989; subsequently joined by Continental Airlines and Alitalia in 1999, but Alitalia and KLM ended their partnership in April 2000; Kenya Airways and Malaysia Airlines are regarded as potential members

Source: Aviation press.

extensive marketing agreement, which is expected to ultimately bridge the SkyTeam and Wings groups. In November, Air New Zealand and Qantas announced a trans-Tasman alliance, while retaining their current different global alliance memberships.

2.34 The expanded consolidation through alliances raised increasing regulatory concerns in terms of a potential adverse impact on competition and consumers. Some proposed major alliances received close examination by relevant national and regional regulatory bodies (see Table A1-2) and, in some cases, certain regulatory measures were introduced to ameliorate the potential anti-competitive aspects of the arrangements. In practice, there has been no systematic regulatory treatment of these arrangements but decisions have been taken on an ad hoc basis within generic competition policy and often dictated by general aero-political considerations of the States concerned.

2.35 In 2002, the U.S. DOT approved and granted antitrust immunity to agreements filed by Delta Air Lines, Air France, Alitalia and CSA Czech Airlines in January; by United Airlines, Austrian Airlines, bmi British Midland, Lauda Air, Lufthansa and SAS in April (subject to the achievement of an "open skies" agreement between the United Kingdom and the United States within a specific period); by Delta Air Lines, Air France, Alitalia, CSA Czech Airlines and Korean Air in June; by American Airlines and Finnair in July; and by American Airlines and Swiss International Air Lines in November. In addition, the DOT

tentatively approved an agreement filed by American Airlines and British Airways (a second application, the first application having been dismissed in 1999) in January, but subsequently dismissed it because the carriers were not prepared to accept the conditions imposed by the DOT including the divestiture of a significant number of slots at London's Heathrow Airport. In November, American Airlines and British Airways filed a third time but for a limited scope agreement under which they would operate codeshare flights except for routes between London and U.S. airports. The DOT allowed an agreement between United Airlines and US Airways in October and was continuing to review an agreement between Continental Airlines, Delta Air Lines and Northwest Airlines.

2.36 The European Commission approved an intra-European alliance agreement between Austrian Airlines Group and Lufthansa in July, and transatlantic alliance agreements between KLM and Northwest Airlines without conditions, and between Lufthansa, SAS and United Airlines with conditions, each in October. The U.K. Office of Fair Trading (OFT) approved a transatlantic alliance agreement between bmi British Midland and United Airlines in November, with the condition that the bilateral restrictions preventing bmi British Midland from operating transatlantic services from Heathrow Airport be lifted. The ACCC and New Zealand Commerce Commission started to investigate a proposed trans-Tasman alliance between Air New Zealand and Qantas in December.

AIRLINE BUSINESS MODELS

2.37 In recent years, successful low-cost carriers have been challenging the full service network models of major airlines. The common features of the business model of low-cost carriers are, with some variations: point-to-point network focusing on short-haul routes, high frequencies, simple low-fare structures, high-density single class with no seat assignment, simple in-flight services, staffing flexibility and minimal overheads, and intensive use of electronic commerce for marketing and distribution (including on-line booking via the Internet and electronic ticketing). To sustain low-cost structures, these carriers usually operate a single aircraft type with high daily aircraft utilization. They also use less-congested secondary airports to ensure short turnarounds and high punctuality and to save airport-related costs. Low operating costs enable low-cost carriers to allocate all their seats to low fares.

2.38 This low-cost formula is not new but has been adopted by many new entrants in the United States following domestic deregulation. Although only a few of the earlier new entrants survived, successful low-cost carriers have established sustainable significant cost advantages and grown rapidly, not only at the national level (for example, Southwest Airlines and jetBlue Airways in the United States, Virgin Blue Airlines in Australia) but increasingly regionally (for example, easyJet, Ryanair and Virgin Express in Europe), and some of them have attracted business as well as vacation passengers. Other entrants into the low-cost market, primarily in the Europe-Mediterranean area, are former tour operator and charter carriers, who are increasing their "seat only" offerings to reflect the greater flexibility demanded by their customers and to avoid loss of business to the new low-cost carriers. The low-cost formula is likely to spread to other regions and be increasingly adopted for international services, market conditions and regulatory arrangements permitting.

2.39 Facing growing cost pressures and the inability to continue to charge business passengers higher fares, the business priorities of major airlines have been forced to shift to redesigning their operation to run more efficiently and developing alternative models which serve to bring passengers (especially business passengers) back to them. One of the responses taken by major airlines has been to set up separate organizations or subsidiaries to handle operations on short-haul routes competing with low-cost carriers or having the potential threat of new entrants. This low-cost "airline-within-an-airline" strategy taken by major airlines tries to combine key ingredients of the low-cost carriers' approach with the reputation and quality of their own brand (for example, Tango by Air Canada, bmi British Midland's bmibaby, and Delta Air Lines' Song), though it is not always durable (for example, British Airways' Go was sold to competitors, while Shuttle by United and US Airways' MetroJet were shut down). Again, this "airline-within-an-airline" is a formula that is likely to take on an international dimension including long-haul and leisure-oriented routes, as it already has in the case of Australian Airlines, a low-cost subsidiary of Qantas.

FARES AND RATES

Tariff establishment

2.40 IATA traffic conferences (including tariff coordinating conferences) have developed most of the support mechanisms for multilateral interlining, such as standards for tickets, handling of passengers and baggage, and interline fares. IATA multilateral interlining among airlines occurs based on fixed IATA fares, which simplify administrative procedures for the interchangeability of tickets. The revenues for interline services are allocated in accordance with either the Multilateral Prorate Agreement (MPA) or special prorate agreements. Almost all IATA carriers (including non-tariff coordinating members) assume that passengers charged IATA fares have a full interline privilege with generally the highest booking availability if the transporting carrier is a party to the Multilateral Interline Traffic Agreement (MITA) or a bilateral interline traffic agreement with a ticketing carrier. This industry recognition serves to facilitate a wide-ranging multilateral interlining system, even though not all airlines actually participate in IATA tariff coordinating conferences. Although non-IATA interlining has grown rapidly in recent years, stimulated by the proliferation of inter-carrier alliances and liberalization of tariff setting, IATA currently estimates that IATA multilateral interlining accounts for about 15 per cent of worldwide passenger traffic.

2.41 Since inter-carrier activities through the traffic conferences involve the cooperation of competitors, exemptions from competition laws have been granted, in some jurisdictions, recognizing the public benefit of the interline system. In recent years, however, more States have looked closely at the application of existing exemptions to such inter-carrier activities. In Australia, the ACCC authorized the IATA passenger agency programme and exempted it from the Trade Practice Act in November 2002. The ACCC subsequently started a formal investigation of the IATA cargo agency programme including IATA tariff coordination arrangements for air cargo. In Europe, the European Commission extended in June the regulation on existing block exemptions from certain aspects of competition law requirements for another three-year period, which allowed airlines of European Economic Area (EEA)

States to continue participating in IATA consultations on passenger tariffs until 30 June 2005. In order to facilitate the Commission's re-examination of whether the block exemption should be further extended after that date, an obligation was newly introduced requiring airlines to report data periodically on the extent and degree of interlining. With respect to U.S. antitrust immunity for tariff coordination activities, the DOT continued to require airlines participating in one of the immunized alliance agreements to withdraw from IATA tariff coordination activities between the United States and countries of designated carriers that were granted antitrust immunity.

2.42 To manage a decline in scope of immunized inter-carrier activities through the IATA machinery and to enhance the attractiveness of IATA's multilateral interline system, a multi-disciplinary task force named the Blue Ribbon Group was established. During 2002, the Group held a series of meetings and studied a new "Standardized Premium Service Interlinable Fare" (SPS-Fare), which would be attractive to passengers, economically satisfactory to airlines and supported by competition authorities. IATA also tried to increase the number of tariff coordinating members, and succeeded in recruiting several major carriers, especially in Asia where Singapore Airlines, Malaysia Airlines, Philippine Airlines, China Airlines and EVA Air all joined.

Tariff developments

2.43 It has been widely recognized that current fare-construction rules, governed either by place of sale and/or ticket issuance, have become unworkable in an environment of Internet and electronic ticketing that does not identify where the passenger is located and what is perceived as the place of sale of a ticket. Since 2000, IATA tariff coordinating members have tried to develop a so-called "Internet package" with the aim of establishing a single set of fare-construction rules that would cover all sales and ticketing media. To make the process easier, in 2002 the expert group concerned decided to split the Internet package into two elements. The first was a new fare construction package related to the removal of the international sales indicators, and the second was a package containing technical changes to simplify rules. In February, IATA tariff coordinating members adopted the fare construction package by a mail vote, while leaving some outstanding issues such as the implementation date to future discussion. In July, the IATA Composite Tariff Conference revisited these issues but did not reach a consensus because of the divergent opinions among members.

2.44 The year witnessed new competitive moves in airline pricing. In Europe, major network carriers began to revamp short-haul fare structures to remain competitive with low-cost airlines. Initiatives included the elimination of some traditional fare restrictions such as Saturday night stay and advance purchase requirements as well as general reduction in fare levels. In the United States, major U.S. airlines continued to offer short-term sale fares targeting leisure passengers, while relaxing fare restrictions attached to higher fares to boost business passenger demand. In August and September, major U.S. carriers implemented a new ticketing policy for non-refundable fares to limit booking changes and stand-by and waiver of fare restrictions, in order to better manage low-fare demands.

PRODUCT DISTRIBUTION

Computer reservation systems (CRS)

2.45 CRS provide subscribers with up-to-date information not only on airline flight schedules and availability of fares and seats but also on a range of travel and leisure services such as hotels, car rentals, rail services and tours. It also enables subscribers to make reservations and to issue tickets. While CRS subscribers have been limited to travel agents and corporate travel departments, consumers accessing reservations services via the Internet also use CRS indirectly. As their presence has expanded, the four major CRS — Amadeus, Galileo, Sabre and Worldspan — have increasingly seen themselves as global distribution systems (GDS), i.e. providers of electronic global distribution services on travel information, reservation capabilities, and e-commerce solutions including the Internet.

2.46 Since the late 1990s, the CRS business has been affected significantly by increasing public awareness of the Internet with a large number of third-party providers in the area of business-to-consumer (B2C), i.e. a business that sells products or provides services to end-user consumers. The major CRS vendors have adapted to a challenge of translating their existing system designed mainly for the use of traditional travel agents into one applicable to any activity of business-to-business (B2B), i.e. a business that sells products or provides services to other businesses, and business-to-business-to-consumer (B2B2C), i.e. transactions in which a company sells a service or product to end-consumers using other companies as intermediaries. As a result, all the major CRS are now serving as a booking engine behind most B2C Web sites and as an on-line travel booking system for major corporations and airlines. They are also providing participating travel agents with a customized Web-booking facility so that CRS vendors can reach consumers indirectly via their travel agents.

2.47 Although many of the original regulatory concerns with CRS have diminished in recent years as sole ownership has moved away from air carriers, some other concerns have emerged with the rapid development of e-commerce. In Europe, the European Commission continued considering amendments to its existing regulation on CRS. In the United States, the DOT, for a fifth time, extended the effectiveness of the current CRS rules for one year (i.e. up to 31 March 2003), allowing additional time to complete a comprehensive review of industry development in light of the airlines' diminishing control of CRS and the rapid growth of Internet use. In November, the DOT invited comments from interested parties on the proposed final revisions to its CRS rules which would eliminate several provisions in the existing rules and concluded that rules regulating Internet use were unnecessary at this stage. With respect to the ICAO CRS Code, at the end of 2002, 31 States either followed the Code or had CRS regulations which were consistent or compatible with it.

Electronic ticketing

2.48 Electronic ticketing, a paperless method for documenting and distributing airline ticket coupons, has seen rapid expansion since it was first implemented for U.S. domestic travel in 1993. In an era of increased competition, electronic ticketing offers considerable cost savings for airlines and travel agents and provides convenience to consumers.

2.49 In the United States, following the initiatives by Alaska Airlines, American Airlines and Continental Airlines in 2001, other major U.S. carriers also started charging paper ticket fees. The carriers subsequently increased fees from $10 to $20 or $25, and expanded applications to more fare types and markets in order to promote phasing out paper tickets. In June, American Airlines announced that it would cease issuing paper tickets for wholly domestic itineraries by March 2003 and plans to stop issuing paper tickets for all other itineraries by December 2003. United Airlines also announced in July that it would stop issuing paper tickets within the United States by July 2003 and issue only electronic tickets for all eligible itineraries, at all locations, domestic and international, by January 2004. According to the Airlines Reporting Corporation (ARC), which manages travel agents' transactions with air carriers in the United States, electronic tickets processed through ARC rose sharply accounting for 80 per cent of the total volume in December 2002, compared with 60 per cent a year earlier and 58 per cent two years earlier. In Canada, Air Canada stopped issuing paper tickets for domestic flights at the end of December. In Europe, it was reported that about 20 per cent of passengers were using electronic tickets.

2.50 Although the use of electronic tickets has been normally applied to single-carrier on-line itineraries, interline electronic ticketing, i.e. the ability to use electronic tickets on flights involving more than one airline, has also been developing since it was first introduced in 1999. During 2002, interline electronic ticketing was launched by American Airlines and Continental Airlines in March, American Airlines and United Airlines also in March, American Airlines and Northwest Airlines in April, American Airlines and Finnair in June, Delta Air Lines and United Airlines in August, United Airlines and US Airways in October, and Delta Air Lines and Northwest Airlines in December.

Travel agents

2.51 The advance of information technology, together with the liberalization of tariffs, continues to have a significant impact on the long-established relationship between airlines and travel agents. Travel agents traditionally acted as distribution outlets on behalf of airlines in exchange for the commissions that airlines paid to them. The heavy reliance on travel agents, however, has gradually been diminished as many States have moved towards liberalized tariff regulations and as e-commerce has led to the emergence of alternative cost-effective outlets. With pricing flexibility and Internet facility, airlines have been able to introduce various kinds of fares and to sell them directly or through the Internet to consumers, thereby cutting down on commission payments. In addition, increasing cost pressures in more competitive environments have provided an incentive for airlines to continue cutting commissions.

2.52 A stepped series of cutting commissions, which started in 1995, continued in March when Delta Air Lines eliminated base commissions (5 per cent capped at $20 for round-trip and $10 for one-way) payment to travel agents for tickets issued in the United States and Canada. American Airlines and Continental Airlines soon followed suit, and subsequently all the major U.S. carriers (with the exception of Southwest Airlines) and Air Canada joined this movement. In Europe, several major carriers adopted a flat-fee booking payment system

depending on the sector flown instead of paying traditional percentage commission on each ticket. The trend to reduce or eliminate commissions has also been growing in Asia and the Pacific, and in Latin America.

2.53 The reduction and elimination of commissions accelerated moves by travel agents toward product specialization, operational efficiencies and the establishment of some service fee schemes, whereby passengers pay a fee to the agent. Some reactions from travel agents to airline commission cuts included threats of boycott and legal action, as well as a call for government intervention. For example, in May 2002 the Canadian Standard Travel Agency Registry (CSTAR) filed a class action lawsuit against six U.S. and Canadian carriers and IATA. In November, Peru's competition authorities fined Iberia, KLM and Lufthansa, siding with the Peruvian Association of Travel Agents that accused the carriers of collaborating to lower commissions. In December, the U.K. Office of Fair Trading rejected a complaint made by the Association of British Travel Agents (ABTA), concluding that British Airways did not infringe the Competition Act 1998 by making low booking payments to travel agents for short haul flights.

Internet

2.54 Multiple distribution channels now co-exist. The pace of acceptance of the new technology-led channel, the Internet, varies among States and according to market segments. However, the use of the Internet both through third-party providers and recently, in particular, directly to consumers and other businesses, has shown a dramatic increase.

2.55 In the area of B2C, four different types of Web sites have emerged: 1) traditional travel agents' Web sites which constitute a simple extension to "brick-and-mortar" outlets and business processes; 2) on-line travel agents which do not have conventional retail outlets; 3) airlines' own Web sites; and 4) Web sites jointly owned by groups of airlines which offer wider product choices than the ones offered by a single airline's Web site. The latter two types of B2C Web sites have enabled airlines to reach more consumers, reduce agency commissions (and a part of booking fees) and manage their inventory more effectively.

2.56 With respect to on-line travel agents, Expedia overtook Travelocity in sales, reporting an 82 per cent increase in gross bookings in 2002. Travelocity, in which Sabre increased its shareholding from about 70 per cent to almost 100 per cent in April, reported an increase of 12 per cent. Some other on-line travel agents use non-traditional approaches. For example, Priceline allows consumers to bid for discounted tickets at fares they choose (a reverse auction system in discounted tickets). Hotwire, which is owned by the Texas Pacific Group with six U.S. major airlines, also adopts a bid-based system for discounted tickets. Trip.com, which was relaunched in April by Cendant Corporation, a parent company of Galileo, also targeted discounted leisure travel products by integrating its service with Cheap Ticket.

2.57 On-line booking facilities on the airlines' own Web sites attracted more consumers, allowing airlines to increase their share of direct sales, reduce costs and better manage inventory. Low-cost carriers tended to use Internet booking to a much wider extent than

major carriers. For example, easyJet claimed that it sold an average of 90 per cent of all seats through the Internet. Southwest Airlines reported that approximately 49 per cent, or over $2.5 billion, of its passenger revenue for 2002 was generated by on-line bookings via its Web site, compared to 40 per cent or $2.1 billion in 2001.

2.58 Another development in the B2C area was the rapid growth of Web sites jointly owned by groups of airlines (see Table 2-4 in detail). In the Asia and Pacific region, Zuji began

Table 2-4. B2C Web sites jointly owned by groups of airlines

Name	Announcement / Operations	Ownership	Service providers	Regulation
Orbitz	Announced in November 1999 (known as "T2"); started operations in June 2001 (U.S.).	American Airlines (joined in April 2000), Continental Airlines, Delta Air Lines, Northwest Airlines and United Airlines; filed a registration for initial public offering in May 2002.	Worldspan, Hotwire	The U.S. DOT gave tentative antitrust clearance in April 2001
Opodo	Announced in February 2000 (known as "Online Travel Portal Ltd"); started operations in November 2001 (Germany), January 2002 (United Kingdom) and April 2002 (France).	Aer Lingus, Air France, Alitalia, Austrian Airlines, British Airways, Finnair, Iberia, KLM and Lufthansa; Amadeus to join in 2003.	Amadeus, Galileo	The European Commission gave competition clearance in November 2001
Zuji	Announced in June 2000 (known as "Travel Exchange Asia"); started operations in July 2002 (Australia, Singapore) and December 2002 (Hong Kong SAR).	All Nippon Airways, Cathay Pacific, China Airlines, Dragon Airlines, EVA Air, Garuda Indonesia, Japan Air System, Japan Airlines, Malaysia Airlines, Northwest Airlines, Philippines Airlines, Qantas, Royal Brunei Airlines, Silk Air, Singapore Airlines, United Airlines and Travelocity.	Abacus and Travelocity (using Sabre's CRS)	The Australian Competition and Consumer Commission (ACCC) gave competition clearance in November 2002
Tabini	Announced in August 2000; Started operations in March 2002 (Japan).	All Nippon Airways, Japan Airlines System (Japan Air System and Japan Airlines), Northwest Airlines, United Airlines, Zuji (AGC Holdings), and Travelocity.	Travelocity (using Sabre's CRS)	—

Source: Aviation press.

operations in Australia and Singapore in July, and in Hong Kong SAR in December. Tabini started operations in Japan in March. In Europe, Opodo opened its local United Kingdom (U.K.) and French sites in January and April, respectively.

2.59 In the B2B area, there was continued development of e-marketplace, connecting airlines with suppliers and buyers through the Internet with the objective of creating cost savings by integrating and streamlining the supply chains. For example, AeroXchange (founded by 13 airlines in 2000 and subsequently joined by 20 affiliated airlines) and Cordiem (formerly AirNewco, founded by nine airlines in 2000), both of which started operations in 2001, enable airlines to purchase airframes, engines and avionics components, maintenance services, fuel and other goods and services from respective suppliers on-line. Global Freight Exchange (GF-X) Operations, which was established by Air France Cargo, British Airways Cargo and Lufthansa Cargo in February 2002, provides an electronic B2B trading platform to facilitate the sale of air freight capacity between air freight forwarders and air cargo carriers.

2.60 One of the primary issues regarding competition and the Internet is whether certain practices associated with the use of the Internet are likely to undermine competition and consumers' benefits. The particular regulatory focus has been on Web sites jointly owned by horizontal competitors holding dominant positions in the relevant markets. In Australia, the ACCC investigated the launch of Zuji and gave competition clearance to it in November. In Europe, the European Commission gave competition clearance to GF-X Operations in October. In the United States, the DOT continued to review Orbitz's business practices. In November, a special commission of the U.S. Congress issued a report which expressed concern related to Orbitz and recommended that the DOT and DOJ immediately consider whether Orbitz should be allowed to maintain its "most-favoured-nation" (MFN) clause. Under the MFN clause, airlines have to agree to provide all fares on, for instance, a) Internet-only fares that the airline posts on its Web site, and b) any fare available for sale to the public through any other distribution channels.

TRAFFIC

2.61 Indicators on the development of airline scheduled traffic in 2002 are given below in terms of international and domestic traffic (including rates of growth and load factors), rankings of carriers as well as countries by traffic volume, along with some estimates regarding non-scheduled traffic.

Scheduled carriers

2.62 On the basis of schedules published in multilateral airline schedule guides, it is estimated that at the end of 2002 there were approximately 806 air carriers worldwide providing international and/or domestic scheduled passenger services (including 76 air carriers which provide both scheduled passenger and all-freight services) and about 90 operating only scheduled all-freight services. The total number of 896 air carriers operating in 2002 compares closely with the 894 recorded in 2001.

Scheduled traffic: world totals

2.63 The total scheduled traffic (domestic plus international) carried by airlines of the 188 Contracting States of ICAO in 2002 is estimated at about 392 billion tonne-kilometres performed, an increase of 1.6 per cent over 2001. These airlines carried a total of about 1 615 million passengers and some 30 million tonnes of freight in 2002, compared with 1 624 million passengers and 29 million tonnes of freight in 2001. In 2002, there was a small reduction in the overall capacity with a relatively small increase in traffic. Hence average load factors on total scheduled services for passenger traffic increased from 69 per cent in 2001 to 71 per cent in 2002 and for passenger/freight/mail traffic combined from 59 per cent to 61 per cent, respectively (Table 2-5).

2.64 Compared with the previous year, in 2002 international scheduled traffic showed increases of about 2 per cent both in tonne-kilometres performed and in the number of passengers carried, and about 6 per cent in freight tonnes carried. International traffic accounted for some 59 per cent of total passenger-kilometres performed, 86 per cent of the freight tonne-kilometres performed and some 68 per cent of the total tonne-kilometres performed — these proportions remained almost unchanged compared to the previous year.

Table 2-5. Scheduled services of airlines of ICAO Contracting States (2002/2001)

	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)								
2001	1 624	2 929 845	69	29	110 698	5 305	385 451	59
2002	1 615	2 942 412	71	30	116 628	4 533	391 795	61
Percentage Change	–0.6	0.4	2.0	3.1	5.4	–14.6	1.6	2.0
INTERNATIONAL								
2001	532	1 715 739	70	18	95 950	2 655	259 521	62
2002	545	1 732 160	73	19	100 588	2 676	265 646	65
Percentage Change	2.4	1.0	3.0	5.6	4.8	0.8	2.4	3.0
DOMESTIC								
2001	1 092	1 214 106	69	11	14 748	2 650	125 930	56
2002	1 070	1 210 252	67	11	16 040	1 857	126 149	54
Percentage Change	–2.0	–0.3	–2.0	-0.9	8.8	–29.9	0.2	–2.0

Source: ICAO Air Transport Reporting Form A.

Table 2-6. Growth of scheduled traffic by region of airline registration — World (2002/2001) (annual percentage change)

	Passengers carried	Passenger-kilometres performed	Freight tonne-km performed	Mail tonne-km performed	Total tonne-km performed
TOTAL (international plus domestic)					
Africa	–3.2	–1.0	–9.7	–16.0	–4.8
Asia and Pacific	4.4	5.5	10.7	2.4	7.3
Europe	–0.2	–1.1	1.2	–2.1	–0.6
Middle East	9.7	10.1	18.1	10.5	12.6
North America	–4.2	–2.4	3.8	–27.8	–1.4
Latin America and Caribbean	–1.0	–1.5	–6.2	12.9	–1.0
Total	–0.6	0.4	5.4	–14.6	1.6
INTERNATIONAL					
Africa	–2.5	–1.2	–10.0	–22.6	–5.3
Asia and Pacific	7.3	4.9	10.7	4.7	7.3
Europe	1.5	–1.2	1.0	–3.4	–0.6
Middle East	13.5	11.0	18.4	9.8	13.4
North America	–2.3	–2.5	2.0	–0.7	–0.5
Latin America and Caribbean	–5.5	–1.4	–11.6	35.9	–3.3
Total	2.4	1.0	4.8	0.8	2.4

Source: ICAO Air Transport Reporting Form A.

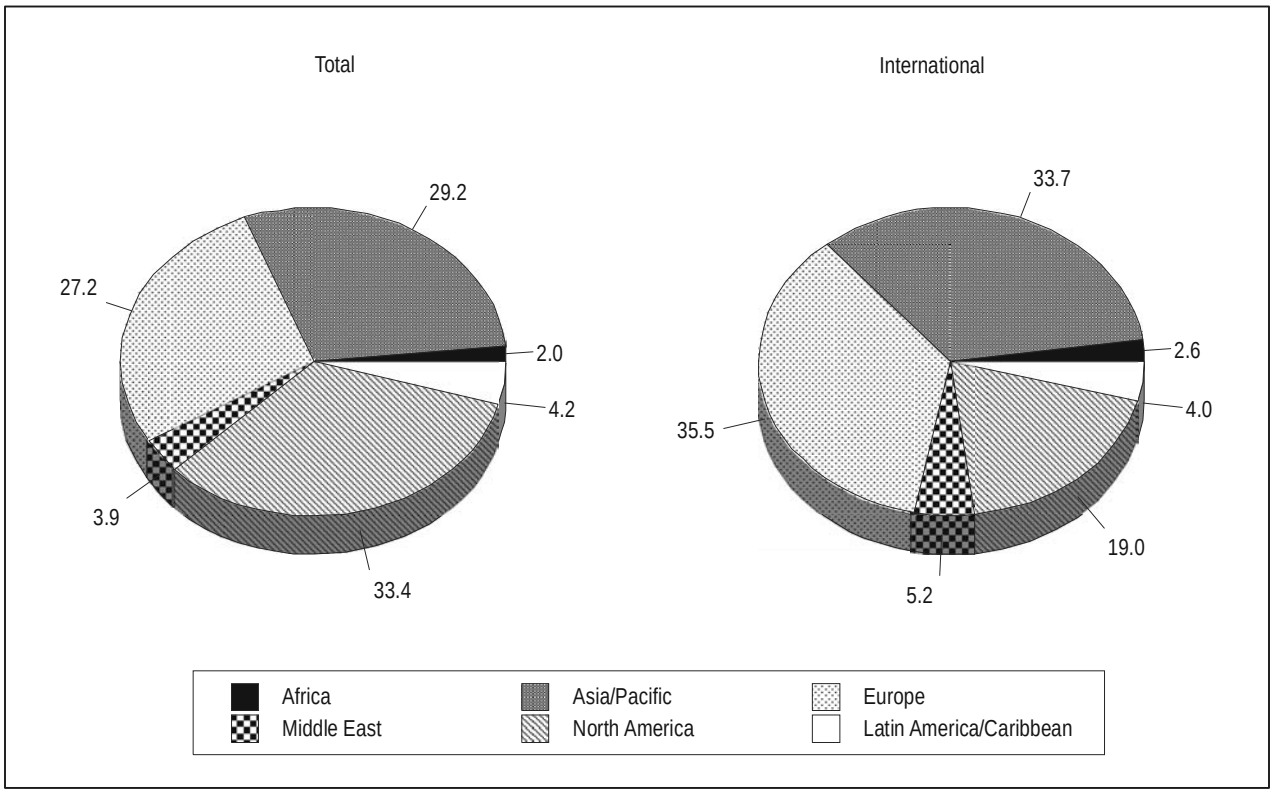
2.65 In 2002 there was little change in total domestic traffic, which remained at about 126 billion tonne-kilometres performed.

Scheduled traffic: regional breakdown

2.66 From 2001 to 2002, developments in total and international scheduled traffic varied considerably among regions of carrier registration with respect to passengers, freight and mail (Table 2-6). In terms of passenger-kilometres performed, the change in traffic ranged from a decrease of some 2 per cent in total traffic for airlines registered in Latin America and the Caribbean and those in North America, to an increase of about 10 per cent for airlines registered in the Middle East. Changes in the passenger-kilometres performed on international services ranged from a decrease of over 2.5 per cent for airlines registered in North America to an increase of 11 per cent for those registered in the Middle East. In terms of freight tonne-kilometres performed, carriers registered in Africa experienced a decrease of about 10 per cent each in total and international traffic while those in Latin America and the

Caribbean showed a contraction of about 12 per cent in international traffic. At the other end of the scale, carriers registered in the Middle East showed increases of about 18 per cent each in total and in international freight tonne-kilometres performed.

2.67 The differences in regional traffic development between 2001 and 2002 affected the distribution of this traffic. The regional distribution for total and for international scheduled traffic in 2002 is shown in Figure 2-1 (detailed traffic data by region are shown in Table A2-1 in Appendix 2). In terms of total scheduled traffic (international plus domestic) in 2002, the airlines of North America carried some 33 per cent of world traffic. However, the largest share of international scheduled traffic (about 36 per cent) was carried by the airlines of Europe.



Source: ICAO Air Transport Reporting Form A.

Figure 2-1. Percentage distribution of scheduled traffic according to region of airline registration — 2002 (total tonne-kilometres performed)

2.68 In 2002, airlines registered in Asia/Pacific showed the highest average annual weight load factor on international scheduled services (about 68 per cent), while those in Africa showed the lowest average load factor (some 53 per cent). Compared with 2001, the average weight load factors for international scheduled services (shown in Table A2-1 in Appendix 2) showed increases in all the regions: of about 4 percentage points for the airlines of Asia/Pacific, 3 percentage points for those of North America, 2 percentage points each for those of Europe, the Middle East and Latin America and the Caribbean, and one percentage point for those of Africa.

Scheduled traffic: rankings by carriers and countries

2.69 Table 2-7 shows the top 30 air carriers in the world in 2002 in terms of the overall 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 2001 and in 1993. Table 2-8 shows the top 30 air carrier rankings according to the same parameters but in terms of international scheduled traffic.

2.70 In 2002, approximately 70 per cent of the total volume of scheduled passenger, freight and mail traffic was accounted for by the top 30 international and/or domestic airlines. On international services, some 73 per cent of all traffic was carried by the top 30 airlines operating international scheduled services. Of these top 30 airlines, 10 each were registered in Asia/Pacific and in Europe, 8 in North America and one each in the Middle East and in Latin America/Caribbean.

2.71 Rankings for the top 30 countries or groups of countries by volume of scheduled traffic generated by their airlines in 2002, 2001 and 1993 according to the same parameters of passenger-kilometres, freight and mail tonne-kilometres and total (passenger, freight and mail) tonne-kilometres, for overall and for international services, are presented in Tables 2-9 and 2-10. In 2002 approximately 47 per cent of the total volume of scheduled passenger, freight and mail traffic was accounted for by the airlines of the four top-ranked countries, namely: the U.S., Japan, Germany and the U.K. (31, 6, 5 and 5 per cent, respectively). On international services, some 37 per cent of all traffic was carried by airlines of the same four countries, namely, the U.S., Germany, the U.K. and Japan (17, 7, 7 and 6 per cent, respectively).

Non-scheduled traffic: world totals

2.72 It is estimated that in 2002 international non-scheduled passenger-kilometres performed throughout the world decreased some 12 per cent compared with 2001 (Table 2-11). Hence the share of such traffic in overall international air passenger traffic decreased from 13.5 per cent to about 12 per cent. Non-scheduled traffic in Europe remains the largest regional component of the world charter market. Domestic non-scheduled passenger traffic is estimated to represent some 5 per cent of total non-scheduled passenger traffic and about 1 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.

Table 2-7. Top 30 scheduled air carriers in 2002 and their ranking in 2001 and 1993 — TOTAL (international and domestic) scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993	Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993	Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993
American	195 763	1	2	2	Federal Express	10 959	1	1	1	American	20 705	1	2	2
United	176 016	2	1	1	Lufthansa	7 358	2	2	2	United	19 295	2	1	1
Delta	153 823	3	3	3	SIA	6 839	3	3	10	Lufthansa	16 791	3	4	6
Northwest	115 851	4	4	4	Korean Air	5 437	4	5	4	Delta	16 086	4	3	3
Air France	96 769	5	7	12	Air France	5 072	5	4	3	SIA	13 983	5	8	10
British Airways	96 557	6	5	5	Cathay Pacific	4 733	6	8	8	Air France	13 782	6	7	8
Lufthansa	93 643	7	8	10	JAL	4 592	7	6	5	British Airways	13 752	7	6	5
Continental	91 718	8	6	7	KLM	4 176	8	7	9	Northwest	13 561	8	5	4
JAL	83 196	9	9	9	Cargolux	4 157	9	9	—	JAL	12 002	9	9	7
SIA	74 151	10	12	13	British Airways	4 054	10	10	12	Federal Express	10 959	10	10	14
Southwest	73 042	11	11	20	United	3 323	11	11	7	KLM	10 030	11	11	12
Qantas	72 891	12	13	17	Northwest	3 049	12	12	6	Korean Air	9 742	12	13	13
Air Canada	69 019	13	14	25	American	2 941	13	13	11	Continental	9 577	13	12	11
US Airways	64 399	14	10	8	United Parcel	2 659	14	14	33	Cathay Pacific	9 381	14	15	15
KLM	58 593	15	15	15	Asiana	2 579	15	16	31	Qantas	8 750	15	14	18
All Nippon Airways	54 220	16	16	14	Nippon Cargo	2 158	16	17	17	Air Canada	8 172	16	16	25
Cathay Pacific	48 831	17	17	18	Delta	2 128	17	15	13	Southwest	6 815	17	18	27
Thai Airways	48 337	18	18	23	Emirates	1 979	18	25	48	US Airways	6 436	18	17	16
Korean Air	45 901	19	19	19	Malaysian Airlines	1 926	19	19	28	Thai Airways	6 241	19	19	22
Iberia	40 416	20	20	22	Air China	1 898	20	23	27	All Nippon Airways	5 801	20	20	20
Malaysian Airlines	36 897	21	22	30	Thai Airways	1 884	21	20	19	Malaysian Airlines	5 342	21	21	30
America West	31 946	22	25	29	Qantas	1 765	22	18	15	Emirates	4 856	22	26	56
Emirates	30 181	23	29	58	Air Canada	1 720	23	21	24	Iberia	4 485	23	24	26
Alitalia	29 619	24	21	21	Polar Air Cargo	1 628	24	29	—	Alitalia	4 368	24	22	21
China Southern Airlines	27 878	25	28	50	Alitalia	1 435	25	24	16	Cargolux	4 157	25	25	—
Virgin Atlantic	27 167	26	26	40	All Nippon Airways	1 385	26	26	25	Asiana	4 118	26	27	43
Varig	26 037	27	27	24	Continental	1 255	27	27	22	Air China	4 015	27	30	37
SAS	24 170	28	30	28	Varig	1 210	28	28	20	Varig	3 633	28	29	23
Air China	23 635	29	34	36	Swiss	1 078	29	206	237	China Southern Airlines	3 511	29	32	59
Air New Zealand	22 255	30	31	34	China Eastern Airlines	1 028	30	31	43	Virgin Atlantic	3 418	30	28	42

1. Most 2002 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.

Table 2-8. Top 30 scheduled air carriers in 2002 and their ranking in 2001 and 1993 — INTERNATIONAL scheduled traffic carried [1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993	Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993	Carrier	Estimated 2002 (millions)	Ranking 2002	2001	1993
British Airways	94 313	1	1	1	Lufthansa	7 319	1	1	1	Lufthansa	16 186	1	1	2
Lufthansa	87 986	2	2	3	SIA	6 839	2	2	6	SIA	13 983	2	3	6
Air France	76 310	3	4	10	Korean Air	5 324	3	3	3	British Airways	13 551	3	2	1
SIA	74 151	4	5	6	Air France	4 904	4	4	2	Air France	11 772	4	4	3
United	69 742	5	3	2	Cathay Pacific	4 733	5	8	9	JAL	10 408	5	5	5
JAL	65 866	6	6	5	Federal Express	4 710	6	5	8	KLM	10 028	6	6	7
KLM	58 577	7	8	8	JAL	4 299	7	7	4	Cathay Pacific	9 381	7	8	12
American	58 552	8	7	4	KLM	4 176	8	6	5	Korean Air	9 216	8	9	8
Northwest	52 443	9	9	7	Cargolux	4 157	9	9	-	United	8 753	9	7	4
Qantas	50 697	10	10	11	British Airways	4 053	10	10	7	American	7 467	10	10	9
Cathay Pacific	48 831	11	12	12	United Parcel	2 659	11	12	26	Northwest	7 020	11	11	10
Air Canada	47 758	12	11	27	Asiana	2 546	12	15	27	Qantas	6 465	12	12	11
Thai Airways	45 084	13	13	15	United	2 425	13	11	11	Thai Airways	5 913	13	14	15
Korean Air	40 972	14	15	13	Northwest	2 261	14	14	10	Air Canada	5 874	14	13	28
Delta	39 358	15	14	9	Nippon Cargo	2 158	15	16	15	Malaysian Airlines	4 920	15	16	20
Continental	33 392	16	16	21	American	2 154	16	13	12	Delta	4 889	16	15	13
Malaysian Airlines	32 191	17	17	19	Emirates	1 979	17	22	46	Emirates	4 856	17	22	43
Iberia	31 108	18	18	16	Malaysian Airlines	1 890	18	17	24	Federal Express	4 710	18	19	18
Emirates	30 181	19	22	44	Thai Airways	1 850	19	19	17	Cargolux	4 157	19	21	-
Virgin Atlantic	27 167	20	21	31	Air China	1 560	20	25	23	Continental	3 950	20	20	25
Alitalia	23 566	21	20	14	Qantas	1 559	21	20	13	Asiana	3 867	21	25	40
Swiss	21 659	22	101	146	Alitalia	1 416	22	21	14	Alitalia	3 749	22	18	14
SAS	19 887	23	25	22	Air Canada	1 410	23	23	25	Iberia	3 552	23	24	19
Air New Zealand	19 802	24	23	26	Polar Air Cargo	1 382	24	27	-	Virgin Atlantic	3 418	24	23	36
All Nippon Airways	18 442	25	24	32	Delta	1 317	25	24	20	Swiss	3 214	25	114	160
Varig	18 054	26	26	20	Swiss	1 077	26	170	190	Air China	2 755	26	31	37
SAA	17 682	27	27	35	LAN Chile	1 001	27	30	47	SAS	2 714	27	29	24
Asiana	14 668	28	29	48	Varig	943	28	26	21	Varig	2 685	28	26	17
Saudia	13 818	29	32	24	All Nippon Airways	942	29	31	36	All Nippon Airways	2 675	29	27	34
US Airways	13 731	30	33	49	El Al	926	30	36	19	United Parcel	2 659	30	30	51

1. Most 2002 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.

Table 2-9. Top 30 countries or groups of countries in 2002 and their ranking in 2001 and 1993 — 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 2002 (millions)	Ranking 2002	2001	1993	Country or group of countries	Estimated 2002 (millions)	Ranking 2002	2001	1993	Country or group of countries	Estimated 2002 (millions)	Ranking 2002	2001	1993
United States	1 017 170	1	1	1	United States	30 985	1	1	1	United States	123 283	1	1	1
Japan	164 773	2	2	3	Japan	8 521	2	2	3	Japan	22 469	2	2	3
United Kingdom	156 381	3	3	2	Republic of Korea	8 016	3	4	5	United Kingdom	20 022	3	7	2
China[2]	123 908	4	6	4	Germany	7 392	4	3	4	Germany	19 156	4	3	4
Hong Kong SAR[3]	53 148	—	—	—	Singapore	6 854	5	5	9	China[2]	16 200	5	8	7
Macao SAR[4]	2 056	—	—	—	France	5 197	6	6	6	Hong Kong SAR[3]	10 821	—	—	—
Germany	121 414	5	5	8	China[2]	5 127	7	8	7	Macao SAR[4]	232	—	—	—
France	115 538	6	4	6	Hong Kong SAR[3]	5 784	—	—	—	France	15 592	6	6	6
Australia	81 349	7	7	7	Macao SAR[4]	27	—	—	—	Singapore	14 140	7	5	9
Singapore	75 620	8	8	9	United Kingdom	4 997	8	7	2	Republic of Korea	13 859	8	4	5
Netherlands	69 493	9	9	11	Netherlands	4 388	9	9	8	Netherlands	11 294	9	9	8
Canada	69 019	10	10	10	Luxembourg	4 158	10	10	125	Australia	9 507	10	12	10
Republic of Korea	62 992	11	11	12	Gulf States [5]	2 804	11	11	20	Canada	8 172	11	14	11
Spain	54 094	12	12	15	Malaysia	1 926	12	13	19	Gulf States[5]	7 364	12	11	20
Russian Federation	49 890	13	13	5	Thailand	1 884	13	15	15	Thailand	6 241	13	15	15
Gulf States[5]	48 809	14	17	23	Australia	1 794	14	12	10	Brazil	5 763	14	18	12
Thailand	48 337	15	15	16	Canada	1 720	15	14	11	Spain	5 718	15	21	23
Brazil	46 092	16	14	14	Brazil	1 608	16	18	12	Russian Federation	5 580	16	20	16
Malaysia	36 897	17	18	21	Italy	1 440	17	17	13	Malaysia	5 342	17	13	19
Italy	34 328	18	16	13	Chile	1 106	18	19	22	Italy	4 798	18	17	13
Scandinavia[6]	29 824	19	21	18	Russian Federation	1 090	19	20	16	Luxembourg	4 210	19	10	125
India	27 929	20	22	24	Switzerland	1 088	20	16	14	Switzerland	3 720	20	16	14
Mexico	27 638	21	20	17	Israel	1 072	21	23	17	Scandinavia[6]	3 598	21	27	25
Switzerland	26 704	22	19	22	Saudi Arabia	876	22	24	18	Mexico	3 129	22	34	39
New Zealand	23 707	23	23	25	Spain	856	23	21	23	India	3 077	23	29	29
South Africa	22 914	24	24	27	South Africa	805	24	25	31	South Africa	2 853	24	25	31
Saudi Arabia	20 804	25	25	20	New Zealand	688	25	26	27	New Zealand	2 822	25	26	27
Ireland	18 575	26	29	44	Scandinavia[6]	688	26	27	25	Saudi Arabia	2 748	26	24	18
Indonesia	18 419	27	26	19	Belgium	656	27	22	26	Israel	2 172	27	23	17
Turkey	16 818	28	27	33	India	585	28	29	29	Turkey	2 117	28	33	37
Philippines	13 962	29	32	26	Colombia	544	29	28	24	Chile	2 110	29	19	22
Austria	13 794	30	30	36	Austria	424	30	32	41	Indonesia	1 879	30	30	21

1. Most 2002 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.
2. For statistical purposes the data for China excludes the traffic for the Hong Kong and Macao Special Administrative Regions (Hong Kong SAR and Macao SAR), and that of the Taiwan province of China.
3. Traffic for the Hong Kong Special Administrative Region (SAR).
4. Traffic for the Macao Special Administrative Region (SAR).
5. Four States — Bahrain, Oman, Qatar and United Arab Emirates.
6. Three States — Denmark, Norway and Sweden.

Table 2-10. Top 30 countries or groups of countries in 2002 and their ranking in 2001 and 1993 — INTERNATIONAL 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 2002 (millions)	Ranking 2002	2001	1993	Country or group of countries	Estimated 2002 (millions)	Ranking 2002	2001	1993	Country or group of countries	Estimated 2002 (millions)	Ranking 2002	2001	1993
United States	277 395	1	1	1	United States	19 625	1	1	1	United States	44 796	1	1	1
United Kingdom	148 184	2	2	2	Republic of Korea	7 871	2	4	5	United Kingdom	19 324	2	3	2
Germany	113 275	3	3	4	Japan	7 596	3	2	3	Germany	18 333	3	4	4
Japan	91 465	4	4	3	Germany	7 353	4	3	4	Japan	16 053	4	2	3
France	79 748	5	5	7	Singapore	6 854	5	5	8	Singapore	14 140	5	7	8
Singapore	75 620	6	6	5	United Kingdom	4 991	6	7	2	Republic of Korea	13 083	6	8	5
Netherlands	69 410	7	7	6	France	4 930	7	6	6	France	12 109	7	5	6
Republic of Korea	55 640	8	9	9	Netherlands	4 387	8	9	7	Netherlands	11 286	8	9	7
Australia	50 813	9	8	8	Luxembourg	4 158	9	10	117	Gulf States[2]	7 347	9	12	19
Gulf States[2]	48 665	10	12	19	China[3]	2 821	10	8	9	Australia	6 475	10	10	10
Canada	47 758	11	10	10	Hong Kong SAR[4]	5 784	—	—	—	Thailand	5 913	11	15	14
Thailand	45 084	12	11	13	Macao SAR[5]	27	—	—	—	Canada	5 874	12	11	13
Spain	36 513	13	13	14	Gulf States[2]	2 803	11	11	19	China[3]	5 400	13	6	9
Malaysia	32 191	14	15	18	Malaysia	1 890	12	13	18	Hong Kong SAR[4]	10 821	—	—	—
China [3]	28 821	15	17	12	Thailand	1 850	13	15	14	Macao SAR[5]	232	—	—	—
Hong Kong SAR[4]	53 148	—	—	—	Australia	1 559	14	12	10	Malaysia	4 920	14	18	18
Macao SAR[5]	2 056	—	—	—	Italy	1 419	15	17	11	Luxembourg	4 210	15	20	117
Switzerland	26 501	16	14	15	Canada	1 410	16	14	13	Spain	4 040	16	13	22
Italy	24 735	17	16	11	Switzerland	1 087	17	16	12	Italy	3 859	17	16	11
Scandinavia[6]	22 041	18	19	20	Israel	1 072	18	23	16	Switzerland	3 699	18	19	12
Brazil	20 761	19	18	16	Chile	1 050	19	19	20	Brazil	2 950	19	14	15
New Zealand	19 802	20	21	23	Brazil	956	20	18	15	Scandinavia[6]	2 829	20	21	26
Russian Federation	19 552	21	20	17	Saudi Arabia	788	21	24	17	New Zealand	2 463	21	24	25
Ireland	18 552	22	26	40	Spain	754	22	21	22	Russian Federation	2 395	22	17	27
South Africa	17 953	23	22	28	South Africa	734	23	25	31	South Africa	2 330	23	25	31
India	15 504	24	25	27	New Zealand	680	24	26	25	Israel	2 139	24	29	16
Turkey	13 822	25	30	34	Scandinavia[6]	663	25	27	26	Saudi Arabia	2 031	25	26	17
Saudi Arabia	13 818	26	28	22	Belgium	656	26	22	23	Austria	1 847	26	32	40
Austria	13 682	27	27	35	Russian Federation	635	27	20	27	India	1 839	27	23	30
Mexico	13 327	28	24	26	Colombia	475	28	28	24	Turkey	1 813	28	30	38
Philippines	12 001	29	31	24	Austria	424	29	32	40	Chile	1 785	29	28	20
Israel	11 862	30	29	25	India	400	30	29	30	Ireland	1 754	30	34	46

1. Most 2002 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.
2. Four States — Bahrain, Oman, Qatar and United Arab Emirates.
3. For statistical purposes the data for China excludes the traffic for the Hong Kong and Macao Special Administrative Regions (Hong Kong SAR and Macao SAR), and that of the Taiwan province of China.
4. Traffic for the Hong Kong Special Administrative Region (SAR).
5. Traffic for the Macao Special Administrative Region (SAR).
6. Three States — Denmark, Norway and Sweden.

FLEETS

2.73 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 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 for aircraft having a maximum take-off mass of less than 9 000 kg (20 000 lbs) are not included.

Orders and deliveries

2.74 In 2002, 497 turbojet aircraft were ordered, compared with 990 in 2001. The financial commitment represented by orders placed with the major aircraft manufacturers in 2002 for these aircraft is estimated to be about $40 billion, down from $69 billion the previous year. In 2002, 999 turbojet aircraft were delivered, compared with 1 219 in 2001. The backlog of unfilled orders decreased from 3 799 such aircraft at the end of 2001 to 3 407 at the end of 2002. The status of orders and deliveries for the year 2002 is shown in Table A2-2, which gives data by manufacturer and model for turbojet and turboprop aircraft.

2.75 The turbojet types shown in Table 2-12 were the most active in 2002 in terms of orders and deliveries for commercial air transport fleets, accounting for about 79 per cent of the orders, 73 per cent of the deliveries made, and 70 per cent of the backlog of unfilled orders. The number of turboprop aircraft ordered in 2002 was 32, with 69 delivered during the year. The backlog of turboprop aircraft was 74 at the end of the year.

Composition

2.76 Between 1993 and 2002, the number of commercial air transport fixed-wing aircraft in service with a take-off mass of 9 000 kg and over increased from 15 554 to 20 877, as shown in Table 2-13. During this period, the number of jet aircraft increased from 12 552 to 16 668, while turboprop aircraft increased from 2 813 to 4 056. The number of piston-engined aircraft declined from 189 to 153, and now constitutes less than 1 per cent of the total world fleet. Aircraft manufactured in China and the Russian Federation are only included in the 2001 and 2002 data.

2.77 BACK Aviation Solutions reported that, as at the end of 2002, there were 1 133 western-built commercial jets in storage, compared with 1 280 jets at the end of the previous year. The number of wide-body aircraft in storage decreased from 334 in 2001 to 286 in 2002 with Airbus A300s, Boeing 767s and 747s, McDonnell Douglas DC-10s and Lockheed L-1011s accounting for 77 per cent of aircraft in the group. Among narrow-body aircraft, Boeing 727s and 737s contributed nearly half of the aircraft in the group. The number of western-built jets available for sale or lease decreased slightly, from 800 in December 2001 to about 790 in December 2002. Available wide-body aircraft were down by 22 to 233.

Table 2-11. Estimated international non-scheduled revenue passenger traffic (2001 and 2002)

Category	2001 Pass.-kms performed (millions)	2001 Percentage of total traffic	2002 Pass.-kms performed (millions)	2002 Percentage of total traffic	Annual change (%) 2002/01
Non-scheduled traffic [1]	272 790	13.7	241 120	12.2	–11.6
Scheduled traffic	1 715 740	86.3	1 732 160	87.8	1.0
TOTAL TRAFFIC	1 988 530	100.0	1 973 280	100.0	–0.8

1. Total non-scheduled traffic of scheduled airlines and non-scheduled operators.

Source: ICAO Air Transport Reporting Form A.

Table 2-12. Main aircraft types ordered and delivered (2002)

Aircraft	Orders	Deliveries	Backlog
Airbus A319	143	85	370
Boeing 737	118	212	757
Bombardier Canadair Regional Jet	44	186	389
Airbus A320	43	116	469
Embraer Regional Jet	43	131	408

Source: Aircraft manufacturers and BACK Aviation Solutions.

Table 2-13. Commercial aircraft fleet[1] in active service (year end 1993, 2001, 2002[2])

Year	TURBOJET Number	TURBOJET Percentage	TURBOPROP Number	TURBOPROP Percentage	PISTON ENGINE Number	PISTON ENGINE Percentage	TOTAL (aircraft all types)
1993	12 552	80.7	2 813	18.1	189	1.2	15 554
2001	15 964	78.8	4 146	20.5	148	0.7	20 258
2003	16 668	79.8	4 056	19.4	153	0.8	20 877

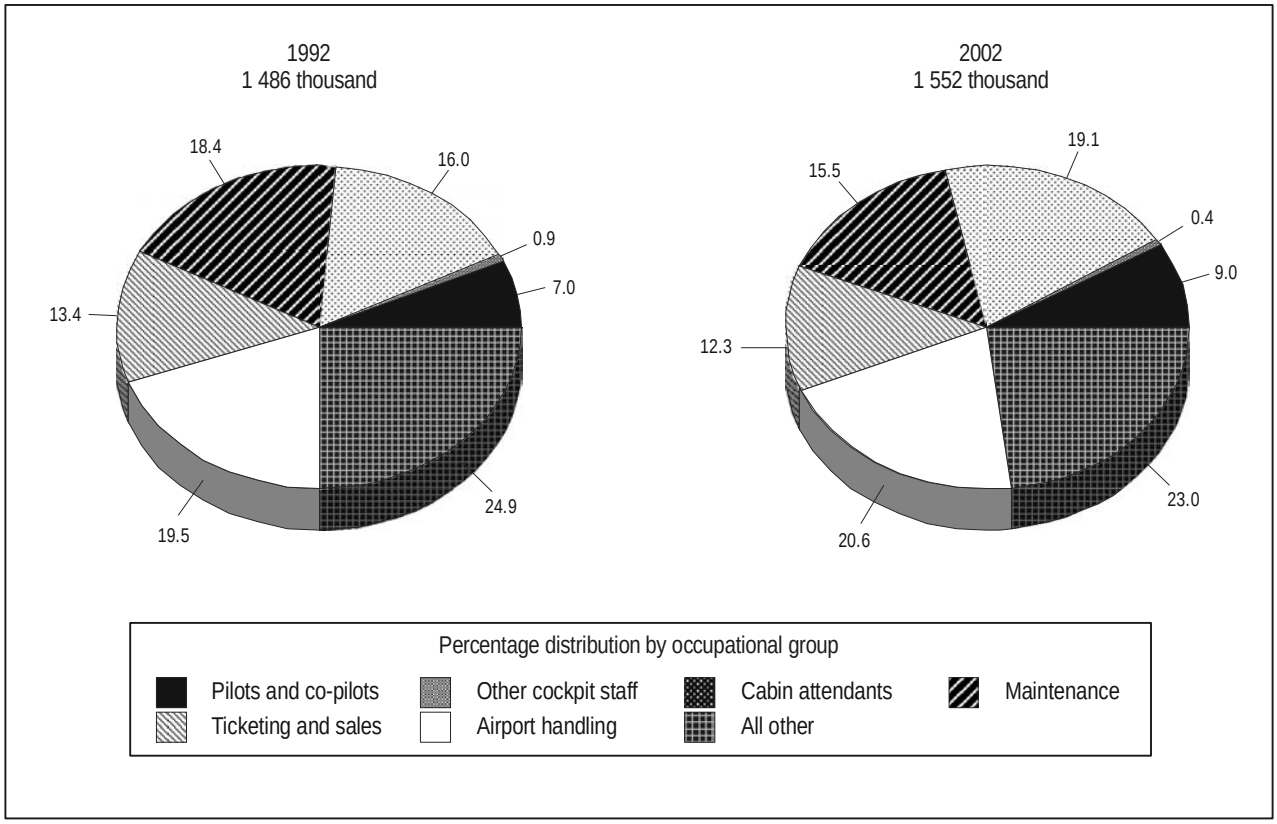
1. Aircraft with a maximum take-off mass of less than 9 000 kg (20 000 lb) are not included.
2. 2001 and 2002 data have a more comprehensive coverage of turbo-prop powered aircraft manufactured in China and the Russian Federation.

Source: BACK Aviation Solutions.

PERSONNEL

2.78 In 2002 commercial air transport services provided employment for an estimated 1.91 million persons who worked for about 3 000 commercial air carriers worldwide in management, traffic planning, flight operations, marketing, sales and other functions.

2.79 Figure 2-2 shows the composition of airline personnel by occupational groups for scheduled and non-scheduled IATA member airlines, 202 of which combined had a workforce of 1.55 million people in 2002. Over the 10-year period 1992 to 2002, the increased share of pilots/co-pilots and cabin attendants employed reflects the expansion in worldwide air transport services, which rose during that period at a rate of 4.9 per cent per annum in terms of total tonne-kilometres performed on total scheduled services and at 6.3 per cent for scheduled services on international routes. The introduction of fly-by-wire avionics and other automated equipment as well as procedures on flight decks of modern aircraft contributed to redundancy affecting "Other cockpit staff". Despite growing fleets, aircraft movements,



Source: IATA.

Figure 2-2. Airline personnel of IATA members — World (1992 and 2002)

passenger numbers and air cargo volumes, the share of airport handling staff grew marginally by 1.2 per cent, representing just a slight increase in absolute terms. In contrast, the share of maintenance personnel decreased in relative and absolute terms. The number of airline personnel required in these functions has been trimmed through technologically-induced productivity gains and subcontracting to independent corporations; in particular, repair and maintenance functions were streamlined through computer-based diagnostic procedures, exchange of pre-manufactured components and outsourcing to specialized maintenance bases. Overall labour productivity (tonne-kilometres performed/per employee) rose at an average 5.2 per cent annually from 1992 to 2002.

FINANCES

Financial results

2.80 Preliminary estimates for 2002 indicate that the world's scheduled airlines as a whole experienced an operating loss of 2.3 per cent of total operating revenues, compared with an operating loss of 3.8 per cent incurred in 2001. Operating revenues of scheduled airlines are tentatively estimated at $312.5 billion in 2002, an increase of about 2 per cent over the $307.5 billion earned in 2001. This increase of $5 billion in operating revenues includes gains through traffic growth and fluctuations in currency exchange rates partly offset by declining real yields. It is estimated that the 2.2 per cent traffic growth over 2001 (for details see section on Traffic above) positively impacted operating revenues for 2002 by $6.7 billion and strengthening major currencies vis-à-vis the U.S. dollar by $3.5 billion; these gains were offset by a drop in real yields of $5.2 billion.

2.81 Operating revenues per tonne-kilometre performed decreased marginally from 74.9 cents in 2001 to an estimated 74.5 cents in 2002. The operating expenses of scheduled airlines are tentatively estimated at $319.8 billion in 2002, a marginal increase of about 0.2 per cent over the $319.3 billion incurred in 2001. This $0.5 billion increase includes exchange rate losses and a marginal rise in unit costs which were almost completely offset by a 1.2 per cent decrease in capacity and minor relief in fuel costs. Average jet fuel prices were 69 cents per gallon in 2002, a decline of 5.4 per cent compared to 2001 (for details see Chapter 1, Crude oil and jet fuel). Operating expenses per tonne-kilometre available increased from 45.91 cents in 2001 to an estimated 46.54 cents in 2002.

2.82 The estimated operating result for the world's scheduled airlines is the difference between operating revenues and expenses and is therefore subject to a relatively wide margin of error. For 2002, there was an operating loss estimated at about $7.3 billion, that is $4.5 billion less than in 2001. The operating loss in 2002 reflects a slow economic recovery along with the lingering effects on airline traffic of the events of 11 September 2001. The SARS epidemic also contributed to a reduction in traffic and poor financial results for those airlines whose fiscal year encompassed the early part of 2003. Reduced fleet capacities and flight frequencies combined with modest traffic growth over 2001 to push up the overall load factor from 59.1 per cent in 2001 to 61.1 per cent in 2002 (Table 2-5). The increase in unit costs over 2001 coupled with a marginal decline in yields pushed up break-even load factors from 61.3 per cent in 2001 to 62.5 per cent in 2002.

2.83 Estimated regional results for 2002 indicate that North American airlines accounted for about 36 per cent of total operating revenues, 38 per cent of total operating costs. Preliminary estimates indicate that operating losses of scheduled airlines registered in North America amounted to $8.5 billion in 2002 compared to $10.6 billion in 2001. Airlines of Europe, Middle East and Africa collectively achieved an operating profit of approximately $600 million in 2002 compared with operating losses of $1.3 billion in 2001. Asia/Pacific accrued an operating profit of $1.2 billion in 2002 and of $800 million in 2001. In contrast, airlines of Latin America/Caribbean accrued operating losses of about $500 million in 2002 and $700 million in 2001.

2.84 The net result is derived from the operating result by taking into account non-operating items and taxes. Preliminary estimates suggest that in 2002 the world's scheduled airlines would end up with a net loss of $11.7 billion compared to $13 billion in 2001. Tables 5-4 and 5-5 in Chapter 5 reveal operating and net results over the period 1993 – 2002 as well as the item-wise distribution of operating revenues and expenses in 1991 and 2001.

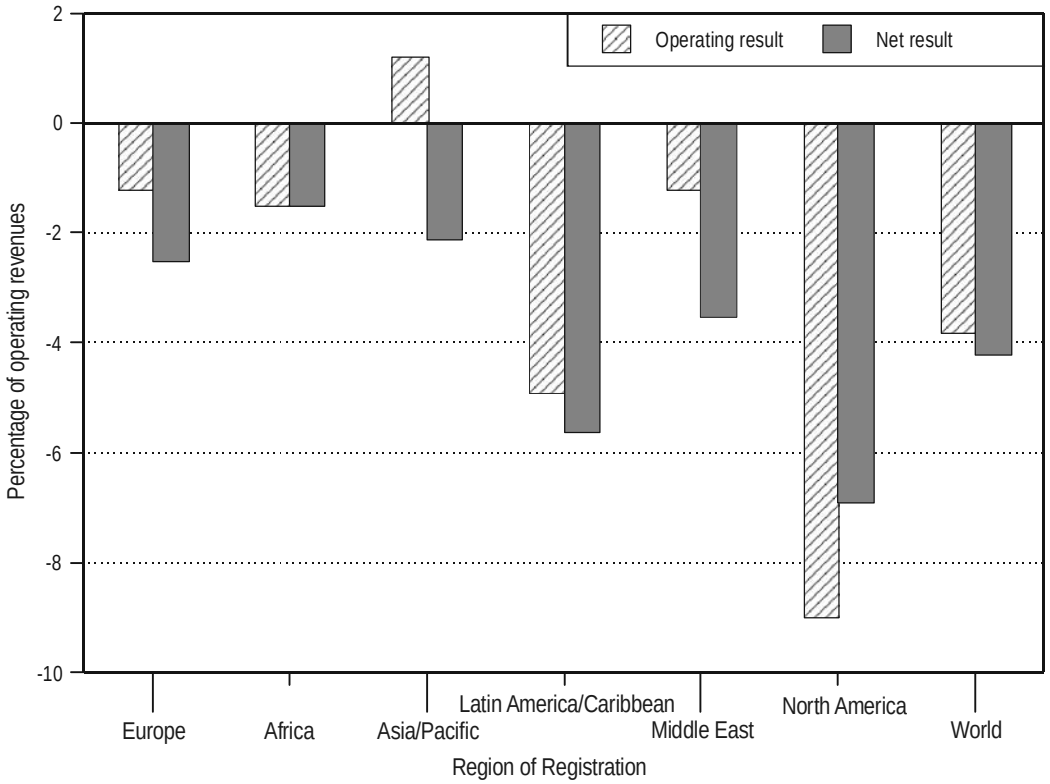
2.85 The estimated cumulative results of the world's scheduled airlines do not portray the considerable differences in the financial performance of individual airlines. In 2001 (complete data were not available for 2002 at the time of publication) it is estimated that of these airlines, about 44 per cent achieved operating profits, while 56 per cent reported operating losses. On a regional basis, in all ICAO statistical regions, with the exception of Asia/Pacific, airlines experienced negative aggregated operating results in 2001. Operating results, expressed as a percentage of operating revenues, ranged from a surplus of 1.2 per cent for the airlines of Asia/Pacific to a significant loss of 9 per cent for those of North America. Net results ranged from a loss of 1.5 per cent of operating revenues for the airlines registered in Africa to a loss of 6.9 per cent for those registered in North America (Figure 2-3).

2.86 Available financial data from non-scheduled carriers do not allow for reliable estimates for 2002. In 2001 operating revenues of non-scheduled carriers, as a group, are tentatively estimated at $7.7 billion compared with $10.1 billion earned in 2000. In 2001 these carriers had an estimated operating profit of $160 million and a net result of some $1 million, after taking into account non-operating items and taxes.

Consolidated balance sheet

2.87 At the end of 2001, the value of total assets of scheduled airlines registered in 187 ICAO Contracting States stood at $436.2 billion, compared to $411.6 billion in 2000 (Table 2-14). They represent three categories: 21 per cent current assets, 60 per cent fixed assets and 19 per cent other assets.

2.88 At the end of 2001, the net value of the aircraft fleet (i.e. after depreciation charges), accounting for about 48 per cent of total assets, stood at $210.1 billion, an increase of 7 per cent over the $196.1 billion at the end of 2000. Accumulated depreciation charges stood at



Source: ICAO Air Transport Reporting Form EF.

Figure 2-3. Financial results of scheduled airlines by region — World (2001)

about $153.3 billion of which $114.5 billion were for retired aircraft, representing some 35 per cent of the gross fleet value. The remaining accumulated depreciation charges covered ground property and equipment and represented some 53 per cent of those assets' gross value.

2.89 During the fiscal years 2000 and 2001, the value of stockholders' equity decreased by some 12 per cent from $97.7 billion to $86.4 billion, and represented in relative terms 20 per cent of total liabilities. During the same period, long-term debt increased from $130 billion to $149.5 billion and made up 34 per cent of total liabilities in 2001 compared to 32 per cent in 2000. At the end of the fiscal year 2001, current liabilities (including unearned transportation revenue) amounted to $117.8 billion or some 27 per cent of total liabilities. Unearned transportation revenue represented about 6 per cent of total liabilities and some 9 per cent of the total traffic revenue for 2001.

2.90 Long-term trends in the performance of balance sheet items may be discerned in Table 2-14 comparing 2001 with 1993 results. At the end of the 2001 fiscal year, total assets stood at $436.2 billion compared to $277.8 billion at the end of 1993. Relative to the totals, the most significant difference between 1993 and 2001 is the decrease in the proportion of current assets from 25 to 21 per cent of the total and the corresponding increase in other assets. The proportion of other assets increased from 14 per cent of total assets in 1993 to

19 per cent in 2001. However, there was a slight relative decrease in investments in affiliated companies from about 5 per cent of total assets in 1993 to 3 per cent in 2001, whereas the share of flight equipment increased and the share of ground property and equipment decreased.

2.91 As regards liabilities, between 1993 and 2001 the share of current liabilities (including unearned transportation revenue) fell from 30 to 27 per cent of total liabilities and long-term debt from 38 to 34 per cent while the share of other medium/long-term liabilities rose from 17 to 19 per cent. The relative increase in stockholders' equity from 15 to 20 per cent is attributed to the larger net balance of unappropriated retained earnings (i.e. cumulative profit) at the end of fiscal year 2001, albeit at far lower levels than 2000.

Table 2-14. Consolidated balance sheet[1]
Scheduled airlines of ICAO Contracting States
(end of fiscal years 1993, 2000 and 2001)

	1993		2000		2001	
	U.S.$ (million)	% of total	U.S.$ (million)	% of total	U.S.$ (million)	% of total
ASSETS						
Current assets	68 660	25	91 930	22	93 650	21
Fixed assets	169 040	61	247 370	60	261 060	60
Flight equipment	128 330	46	196 120	48	210 120	48
Ground property and equipment	25 760	9	33 600	8	33 640	8
Land	2 340	1	4 350	1	4 150	1
Investments in affiliated companies	12 610	5	13 300	3	13 150	3
Other assets	40 140	14	72 300	18	81 470	19
TOTAL ASSETS	277 840	100	411 600	100	436 180	100
LIABILITIES						
Current liabilities	84 110	30	111 340	27	117 760	27
Current liabilities	69 720	25	88 070	21	91 180	21
Unearned transportation revenues	14 390	5	23 270	6	26 580	6
Long/medium-term liabilities	150 680	54	202 550	49	232 020	53
Long-term debt	104 220	38	129 980	32	149 460	34
Other medium/long-term liabilities	46 460	17	72 570	18	82 560	19
Stockholders' equity	43 050	15	97 710	24	86 400	20
Share capital	23 110	8	24 360	6	24 140	6
Other capital	19 940	7	73 350	18	62 260	14
TOTAL LIABILITIES	277 840	100	411 600	100	436 180	100
ACCUMULATED DEPRECIATION						
Flight equipment	82 360	76	109 580	75	114 540	75
Ground property and equipment	26 290	24	37 130	25	38 790	25
TOTAL ACCUMULATED DEPRECIATION	108 650	100	146 710	100	153 330	100

1. Excludes Domestic Operations within the CIS for 1993.
Source: ICAO Air Transport Reporting Form EF.

Chapter 3
Airports and Air Navigation Services

3.1 This chapter discusses developments in 2002 in the management, organization, infrastructure, traffic and financing of airports and air navigation facilities and services.

AIRPORTS

Management and organization

3.2 Aimed at improving the efficiency of financing, management and operations, the establishment of autonomous authorities and private sector participation for airports continued in 2002, although at a much slower pace than in previous years. Impacted by stagnant airport traffic and a modest economic outlook, privatization projects were deferred for some airports. In order to boost traffic, several airports, mainly in the Asia/Pacific Region, offered lower landing charges and other incentives to airlines.

3.3 Airport alliances are evolving. A joint venture was established between the German Fraport Group and the Indian Sharjah Group with the objective to bid for the lease of four airports in India. The Pantares Alliance, composed of Fraport and Amsterdam Schiphol Airport Group, was awarded the concession to develop and operate the new cargo logistics centre of Hong Kong International Airport.

3.4 Secondary airports, located either in the vicinity of large conurbations or in provincial cities, continued to attract growing traffic from emerging low-cost carriers. This phenomenon, observed essentially at European airports, often resulted in higher traffic growth rates than at other airports that are served primarily by established carriers.

3.5 In Africa, the management of Kilimanjaro airport (United Republic of Tanzania) was granted to Kilimanjaro Airports Development Company (KADCO), a private company. Bids for concession were submitted for the management of Algiers' airport (Algeria). A concession for the management of Djibouti airport was awarded to Dubai Ports International Authority. The Government of Mali announced its intention to transfer the management of Bamako airport to a private concessionaire. In the Middle East, an independent airport authority was established for the management of Tehran airport (Islamic Republic of Iran) while the Government of Lebanon adopted draft legislation providing for a commercial entity to operate Beirut airport.

3.6 In Asia, China embarked, on a trial basis, on substantial airport management reform with greater involvement of the local authorities, including measures to encourage local investment and management and to promote autonomous, innovative management practices. Under the reform scheme, hub airports will focus on strategic initiatives to fulfill their development potential, while major regional airports should specialize and strengthen links with their regions. Smaller airports are expected to pursue innovative approaches to become more financially sustainable. Hainan's Meilan Haikou Airport Company Ltd. launched an Initial Public Offering on the Hong Kong stock exchange; Copenhagen Airport Development International A/S agreed to take a stake of up to 20 per cent of the issued share capital of that airport company in addition to a 10-year contract to provide advisory services for airport operations, capacity utilization and expansion, as well as development of commercial activities. The Government of India announced its intention to lease four airports, namely New Delhi, Mumbai, Kolkata and Chennai, to private sector operators; it also encouraged private sector investors to develop proposals for the construction of "greenfield" airports and progress in this regard was made for airport developments in Bangalore, Goa and Hyderabad. The Government of Japan abandoned plans to privatize the international airports of Tokyo-Narita, Osaka-Kansai and Nagoya-Chubu but prepared a proposal for a special-purpose company to operate Tokyo-Narita. The Schiphol Group withdrew from a partnership deal with Malaysia Airport Holdings Bhd for the management of 37 commercial airports in Malaysia. The Airports Authority of Thailand was corporatized into the Airports of Thailand Public Company as a fully-owned subsidiary of the Ministry of Finance; it operates the five international airports of Thailand located in Bangkok, Chiang Mai, Chiang Rai, Hat Yai and Phuket.

3.7 In the Pacific, a 99-year lease contract for the management of Sydney-Kingsford-Smith airport was awarded to the Southern Cross Airports Corporation, and a concession was granted for the management of Essendon airport (Australia). The Auckland City Council sold its 12.8 per cent share in Auckland International Airport to 55 institutional, mostly foreign, investors; Air New Zealand sold Mount Cook Airport to Tourism Milford, a local company (New Zealand).

3.8 In South America, Alterra Partners acquired 42.7 per cent ownership of Lima-"Jorge Chavez" international airport (Peru). The Government of Uruguay announced that Montevideo-Carrasco international airport would be privatized. In the Caribbean, the management of the Jardines de Rey airport (Cuba) was granted to the Spanish Airport Authority AENA. Concessions were extended from 5 to 25 years for five airports of the Dominican Republic, including those in Puerto Plata and Santo Domingo.

3.9 In Europe, the Argentinian company Corporación América concluded a 30-year concession contract to manage the Yerevan-Zvartnots airport (Armenia). The City of Salzburg (Austria) acquired a 50 per cent ownership of the local airport. The Government of the Czech Republic announced its intention to sell a 49 per cent share of the management company of Prague airport to private investors and to transform the Czech Airport Authority, responsible for the management of the airports of Brno, Karlovy Vary and Ostrava, into a joint-stock company. A 40-year concession extension was awarded for the management of Bergamo airport (Italy). Mediterranean Link Company Ltd., in cooperation with Alterra Partners,

bought a 40 per cent share of Malta airport. The Dutch Government decided not to place the total control of Amsterdam Schiphol Airport Group into the hands of the private sector. A consortium between the Fraport Group and the local Bayindir Group signed a management contract for Antalya airport, Turkey. In the Ukraine, an airport holding company was established for the management of the seven busiest airports. In the United Kingdom, Peel Airport Ltd. Company acquired a 50 per cent stake of Sheffield City airport, and Alterra Partners took over 28.6 per cent of the ownership of London-Luton airport.

Major airport projects

3.10 ICAO regional air navigation plans listed 1 195 airports worldwide that were open to international air transport services at the end of 2002. That same year, 228 airport projects in 94 States were reported to be completed, under construction or projected, all aimed at providing more capacity at major airports. Almost three-quarters of these projects (72 per cent) were concentrated in three ICAO regions: Europe, Asia/Pacific and North America, involving: 97 airports in 31 European States; 43 airports in18 Asian States; and 25 airports in the U.S. and Mexico. From Africa, the Middle East and South America/Caribbean a combined 63 airport projects were reported in 43 States. The majority of projects were aimed at increasing passenger capacity by adding new terminals or expanding existing terminals. Twelve projects were under way to establish railway links between airports and the cities they serve or to connect airports with national and international railway networks.

3.11 Tables 3-1 and 3-2 present an overview of major airport projects around the world, although these listings are not exhaustive. Table 3-1 identifies the various development stages or types of airport projects affecting 40 airports in 30 countries. During 2002, four new airports became operational. Three projects were progressing with international airport openings expected between 2002 and 2006, whereas eight new international airports were under construction. In twelve instances, plans were announced, feasibility studies continued or sites selected for new international airports, while international airport projects in three capital cities were cancelled or deferred. With regard to secondary airports serving international traffic between regional centres, plans were also announced for nine new international airport developments in six countries.

3.12 New terminals or significant expansion of passenger terminals were under construction at about 118 major airports around the world. Most airports where notable construction projects were in progress during 2002 are located in Europe, Asia and North America. Terminal expansion projects were planned for another 88 major airports around the world. The number of projects decreased considerably in 2002 and some airports postponed or deferred new projects, often as a consequence of the events of 11 September 2001 and the ensuing slowdown in air transport services. Additional runway capacity became operational during 2002 at three airports, new runways were under construction at five airports, and were at the planning stage for another 18 airports in 16 countries. Table 3-2 lists selected airport projects and distinguishes between those that specifically target capacity expansion through construction of runways or either new or significantly enlarged passenger terminals.

Table 3-1. Major new airport projects, 2002

Stage/Type	Country	Name/Location
Operational as of 2002	Eritrea	Massawa
	Lao PDR	Pakse
	Malaysia	Wakuba/Tawau
	Pakistan	Lahore
Scheduled to open as of:		
2003/04	China	Guangzhou/Huadu
2003	Iran (Islamic Republic of)	Iman Khomeini/Tehran
2005/06	Thailand	Bangkok/Suvarnabhumi
Work in progress	Argentina	Neuquen
	China	Huanglong
		Sichuan
	India	Bangalore
	Indonesia	Padang/Ketaping
	Japan	Nagoya/Chubu
	Myanmar	Yangon/Hanthawady
	Saudi Arabia	Dawadmi
Planned or under feasibility study	Chile	Santiago de Chile
	China	Beijing
	Ecuador	Quito
	Japan	Fukuoka
	Mongolia	Ulan Bator
	Pakistan	Hyderabad
	Philippines	Palawan
	Poland	Warsaw
	Qatar	Doha
	Senegal	Dakar
	South Africa	Durban
	United States	Chicago/Peotone
Cancelled/deferred	France	Paris
	Mexico	Mexico City-Texcoco
	Portugal	Lisbon
Planned as secondary airport serving international traffic between regional centres	China	Chengdu/Shuangliu
		Wenshen
	Cuba	Cienfuegos
		Santiago
	France	Nantes/Notre Dame des Landes
		St. Pierre/Pointe Blanche
	Greece	Samothraki
	Oman	Ras Al-Hadd
	United Arab Emirates	Ajman

Table 3-2. Major airport construction projects, 2002

Stage Type	Country	Name/Location
Runway operational as of 2002	Finland	Helsinki/Vantaa
	Japan	Tokyo-Narita
	Portugal	Funchal
New runway projects under construction	China	Haikou-Dayingshu
	Republic of Korea	Incheon
	United Kingdom	Edinburgh
	United States	St. Louis Lambert
	Yemen	Sanaa
New runway projects announced	Austria	Vienna
	Brazil	Sao Paulo-Guarulhos
	Bulgaria	Sofia
	France	Paris
	Germany	Frankfurt
	Netherlands	Amsterdam-Schiphol
	New Zealand	Auckland
	Peru	Lima
	Russian Federation	Moscow/Sheremetyevo
	Serbia and Montenegro	Belgrade
	South Africa	Cape Town
	Spain	Madrid-Barajas
	Sri Lanka	Colombo
	United Arab Emirates	Fujairah
		Abu Dhabi
	United Kingdom	London-Heathrow
		London-Stansted
	United States	Chicago/O'Hare
		Cincinnati/North Kentucky
New passenger terminals completed	Australia	Melbourne
	Brazil	Porto Alegre
	Cambodia	Phnom Penh
	Denmark	Billund
	Ethiopia	Addis Ababa
	Germany	Munich
	Italy	Venice
	Mexico	Culiacan
	Pakistan	Karachi
	Switzerland	Geneva
	United Kingdom	Orkney
		Stornoway
	United States	Denver
		San Juan-Puerto Rico
New or significant expansion of passenger terminal under construction	Algeria	Algiers
	Australia	Sydney
	Benin	Cotonou
	China	Dalian
	Finland	Oulu

Stage Type	Country	Name/Location
	France	Paris-Charles de Gaulle
		Nice
	Germany	Frankfurt
		Hamburg
	Guadeloupe	Pointe-à-Pitre
	Ireland	Dublin
	Japan	Tokyo-Narita
	Kazakhstan	Almaty
	Kuwait	Kuwait-City
	Peru	Nazca
	Portugal	Faro
	South Africa	Cape Town
	Switzerland	Basel Mulhouse
	Turkey	Istanbul
	Vanuatu	Port Vila
	United States	St. Louis-Lambert
Postponed/deferred		
New terminals	Germany	Berlin
	Portugal	Lisbon Portela
Rail link	Australia	Melbourne

Airport traffic

3.13 The top 25 airports worldwide, in terms of total passenger throughput, reported traffic to have reached 1 022 million passengers in 2002, representing zero growth over 2001 (see Table 3-3). Their passenger traffic represents about 33 per cent of the world total (scheduled and non-scheduled) passenger throughput or an average per airport of some 112 000 passengers daily. There were 14 U.S.-based airports among the top 25. Compared with 2001, traffic among the top 25 airports in 2002 indicated that San Francisco showed the largest relative decline (9.4 per cent) whereas Beijing traffic registered the greatest increase (11 per cent). These 25 airports combined handled just over 10.8 million aircraft movements in 2002, corresponding to an average per airport of one take-off or landing every 73 seconds. Traffic, in terms of aircraft movements, declined by 1.7 per cent over 2001.

3.14 There are significant differences between airports when their 2002 traffic is ranked by either passenger throughput or by aircraft movements. For example, Tokyo-Haneda ranks fourth in terms of passengers handled but 38th in terms of aircraft movements; Hong Kong is 15th by passengers but 53rd by movements; Singapore is 24th by passengers but 68th by movements; and Bangkok is 20th by passengers but 55th by movements. These cases illustrate that a substantial part of air transport services at these airports has been carried

Table 3-3. Total traffic at top-25 airports — World (2002 and 2001)

No.	Airport[1] (ranked by TOTAL passengers)	Passengers embarked and disembarked				Aircraft movements			
		2002[2] (thousands)	2001 (thousands)	Change 2002/2001 (%)	Average change per annum 2002/1993 (%)	2002[2] (thousands)	2001 (thousands)	Change 2002/2001 (%)	Average change per annum 2002/1993 (%)
1	Atlanta (2)	76 611	75 503	1.5	5.4	871.6	876.0	–0.5	3.4
2	Chicago (1)	66 566	66 955	–0.6	0.2	892.5	875.1	2.0	1.0
3	London-Heathrow (10)	63 035	60 454	4.3	3.2	460.3	457.6	0.6	1.7
4	Tokyo-Haneda (38)	61 414	58 657	4.7	4.4	276.4	262.0	5.5	4.3
5	Los Angeles (4)	56 224	61 606	–8.7	1.8	626.8	707.3	–11.4	0.1
6	Dallas/Ft.Worth (3)	52 829	55 151	–4.2	0.7	752.8	770.6	–2.3	–0.5
7	Paris-Charles de Gaulle (5)	48 256	47 930	0.7	7.3	501.7	515.1	–2.6	5.7
8	Frankfurt (11)	48 174	47 517	1.4	4.7	450.3	445.6	1.1	3.4
9	Amsterdam (18)	40 588	39 309	3.3	7.7	401.4	416.5	–3.6	5.0
10	Denver (7)	35 651	36 093	–1.2	1.0	495.8	468.3	5.9	–0.6
11	Phoenix (8)	35 547	35 439	0.3	4.7	489.4	488.7	0.1	3.1
12	Las Vegas (17)	35 009	35 181	–0.5	5.0	404.6	402.2	0.6	2.7
13	Houston-G.Bush Intl.(14)	33 905	34 804	–2.6	5.9	436.6	450.2	–3.0	2.5
14	Madrid (24)	33 677	33 778	–0.3	7.7	363.7	371.2	–2.0	7.7
15	Hong Kong (53)	33 451	32 027	4.4	3.6	206.7	196.9	5.0	5.0
16	Minneapolis (9)	32 630	34 308	-4.9	3.8	460.8	452.3	1.9	1.9
17	Detroit (12)	32 478	32 294	0.6	3.3	446.9	478.0	–6.5	1.3
18	New York-Kennedy (35)	30 800	29 349	4.9	1.6	277.3	283.5	–2.2	–1.4
19	San Francisco (30)	30 751	33 944	–9.4	–0.5	331.9	367.5	–9.7	–1.8
20	Bangkok(55)	30 485	28 808	5.8	6.6	198.0	187.3	5.7	4.5
21	New York-Newark (22)	30 442	30 558	–0.4	1.9	390.3	422.7	–7.7	–0.7
22	Miami (21)	30 060	31 668	–5.1	0.5	391.0	417.0	–6.2	–1.7
23	London-Gatwick (47)	29 518	31 097	–5.1	4.4	233.6	244.1	–4.3	3.2
24	Singapore(68)	27 374	25 552	7.1	4.3	174.8	179.0	–2.3	2.8
25	Beijing CN (46)	26 845	24 176	11.0	n.a.	234.7	220.6	6.4	n.a.
	T O T A L	1 022 320	1 022 158	0.0	3.7	10 769.9	10 955.3	–1.7	2.0

1. Ranking by total commercial aircraft movements given in brackets.
2. 2002 data are still preliminary, actual ranking and percentage change may differ when final data become available. Passenger and aircraft movement data are estimated in respect of Tokyo-Haneda and Paris CDG.

Source: ICAO Air Transport Reporting Form I, ACI and Airport Web sites.

on wide-body aircraft. Several U.S. airports, not ranking among the top-25 list by passengers and therefore excluded from Table 3-3, would qualify for a top-25 list by movements as follows: Cincinnati (13), St. Louis (15), Charlotte (16), Pittsburgh (19), Philadelphia (20), and Boston (25).

3.15 Table 3-3 includes the average annual changes over the period 2002/1993 to illustrate the long-term growth rate of airport traffic. The number of passengers handled at these airports increased on average by 3.7 per cent per annum over the 1993-2002 period, while corresponding aircraft movements increased at a 2 per cent rate, again demonstrating a trend towards the use of larger aircraft. Substantial differences occur in the respective growth rates among individual airports.

3.16 Table 3-4 lists the top-25 airports worldwide in terms of *international* passengers handled. In marked contrast to the listing in Table 3-3, only three of the 25 airports are located in the U.S. These 25 airports represented about 2 per cent of all airports serving international operations. They handled about 561 million passengers in 2002 or 52 per cent of the world total (scheduled and non-scheduled) of international passengers. In 2002, total international passenger traffic at these 25 airports increased by 1.2 per cent, while total international aircraft movements registered a marginal decline of 0.3 per cent over 2001. Airports with a significant relative decline in international passenger traffic include Brussels (-26.8 per cent), Zurich (-13.8 per cent) and New York-Kennedy (-8.2 per cent). Airports that registered a significant growth were Dubai (18.2 per cent), London-Stansted (16.8 per cent) and Tokyo-Narita (12.3 per cent).

3.17 Over the 1993-2002 period, the number of *international* passengers handled at these airports increased at a rate of 5.4 per cent per annum, whereas international aircraft movements increased at 5 per cent per annum. Over this period, the highest annual growth rate recorded at an individual airport was, in terms of passenger traffic, 21.6 per cent for London-Stansted and in terms of international aircraft movements about 20.4 per cent for Milan-Malpensa followed by 14.9 per cent for London-Stansted.

Airport finances

3.18 Until 2001 the financial situation of international airports had continued to improve on an annual basis for many years. More and more airports worldwide had been recovering their expenses through charges on air traffic and income from concessions, rentals and other non-aeronautical sources. However, a large number of the 1 195 airports open to international air transport services still did not recover all their expenses, principally owing to low traffic volumes as well as organizational structure (common to most financially viable airports is that they are operated by autonomous bodies or entities) with inadequate financial control and accounting procedures frequently being major contributing factors.

3.19 As a consequence of the events of September 2001, airports in North America showed a noticeable decrease in revenues for 2001, while the financial situation of airports in other regions of the world was still solid with airports in Asia/Pacific least affected. The full effect of September 11 events with regard to the financial situation of airports and the related

Table 3-4. Total international traffic at top-25 airports — World (2002 and 2001)

Rank No.	Airport[1] (ranked by INTERNATIONAL passengers)	International passengers embarked and disembarked				International aircraft movements			
		2002[2] (thousands)	2001 (thousands)	Change 2002/2001 (%)	Average change per annum 2002/1993 (%)	2002[2] (thousands)	2001 (thousands)	Change 2002/2001 (%)	Average change per annum 2002/1993 (%)
1	London-Heathrow (2)	56 361	53 820	4.7	3.6	399.4	394.6	1.2	2.5
2	Paris-Charles de Gaulle (1)	43 346	42 859	1.1	7.1	439.8	450.0	–2.3	5.6
3	Amsterdam-Schiphol (3)	40 342	39 167	3.0	7.7	393.9	408.6	–3.6	5.1
4	Frankfurt (4)	40 283	39 446	2.1	5.4	361.6	354.7	1.9	3.8
5	Hong Kong (10)	33 451	32 027	4.4	3.6	206.7	196.9	5.0	4.8
6	Singapore (14)	27 374	25 552	7.1	4.3	174.8	179.0	–2.3	2.8
7	London-Gatwick (11)	26 091	28 117	–7.2	3.8	186.1	200.0	–7.0	2.9
8	Tokyo-Narita (17)	24 981	22 241	12.3	3.1	153.8	125.6	22.5	3.3
9	Bangkok (20)	23 181	21 395	8.3	6.8	139.0	132.3	5.1	4.0
10	Seoul/Incheon (28)[3]	18 209	14 279	27.5	5.6	122.5	84.2	45.5	6.1
11	Madrid (12)	17 240	17 060	1.1	8.0	180.8	179.7	0.6	7.1
12	Taipei (22)	16 999	16 493	3.1	4.8	132.4	123.9	6.9	n.a.
13	Zurich (6)	16 971	19 698	–13.8	3.7	230.3	255.1	–9.7	3.1
14	Copenhagen (7)	16 428	16 279	0.9	6.0	226.9	246.9	–8.1	3.6
15	Manchester (25)	15 875	16 259	–2.4	4.4	128.2	131.0	–2.1	3.7
16	New York-Kennedy (29)	15 273	16 639	–8.2	0.3	104.0	108.0	–3.7	0.8
17	Los Angeles (30)	14 845	15 950	–6.9	2.4	102.4	106.5	–3.8	4.9
18	Munich (8)	14 684	14 944	–1.7	7.2	211.3	207.2	2.0	7.8
19	Dubai(23)	14 664	12 401	18.2	11.1	130.9	117.2	11.7	4.9
20	Toronto (9)	14 658	15 739	–6.9	4.6	210.0	191.7	9.5	6.3
21	Brussels (5)	14 320	19 572	–26.8	4.0	243.8	286.8	–15.0	2.9
22	Dublin (18)	14 311	13 547	5.6	11.6	152.0	153.5	–1.0	7.3
23	Miami (13)	14 266	15 249	–6.4	1.6	180.3	186.1	–3.1	2.1
24	Milan–Malpensa (16)	13 633	14 201	–4.0	18.7	169.1	177.1	–4.5	20.4
25	London-Stansted (27)	13 588	11 634	16.8	21.6	124.3	122.4	1.6	14.9
	TOTAL	561 374	554 568	1.2	5.4	5 104.3	5 119	–0.3	5

1. Ranking by international commercial aircraft movements given in brackets.
2. 2002 data are still preliminary; actual ranking and percentage change may differ when final data become available.
3. The new airport Seoul, Incheon International, opened on 30 March 2001.

Note.— Year 2002 passenger and aircraft movement data are estimated in respect of Paris CDG, Amsterdam, Taipei, Dubai, Brussels and Milan-Malpensa.

Source: ICAO Air Transport Reporting Form I, ACI and Airport Web sites.

economic downturn was felt in 2002. In addition to decreased revenues from the decline in air traffic, which affected revenues from airport charges as well as revenues from non-aeronautical activities, costs increased for new security measures and war risk insurance premiums. For a second consecutive year airports in North America suffered the most. The economic effects on airports in Europe were to a certain extent counter-balanced by the rapid growth in traffic by low-cost carriers.

3.20 Revenues from non-aeronautical, or commercial, activities accounted in 2002 for more than 50 per cent of total revenues worldwide and have become the main source of income for most major airports in Europe and North America as well as in the Middle East and Asia/Pacific regions. The effects of the abolition of duty-free shopping for traveling within the European Community have been largely overcome as a result of new market strategies. In Africa and Latin America, revenues from non-aeronautical activities were on average much lower.

3.21 The share which landing and associated airport charges represent of total airline operating expenses has fluctuated over the last ten years between 3.9 per cent and 4.5 per cent. After a stabilization at 4.4 per cent in 1998 and 1999 there was a decline of the share to 4.2 per cent in 2000 and to 4 per cent in 2001 (preliminary data), partly reflecting an increase in other costs, particularly jet fuel and oil.

AIR NAVIGATION FACILITIES AND SERVICES

Management and organization

3.22 There was no known activity on the transfer of the provision of air navigation services from government departments to autonomous entities in 2002. At the same time a collaborative agreement was concluded between two of the world's leading air traffic service providers, National Air Traffic Services (NATS) of the United Kingdom and Nav Canada to increase collaboration between the organizations.

Finances

3.23 The financial situation of air navigation services had continued to improve through most of 2001, particularly where they were operated by autonomous entities. The improvement had been worldwide and was primarily due to the growing emphasis States at large are placing on recovering their air navigation services costs, and the continued growth of air traffic. Also of relevance had been the increase in the number of States levying approach and aerodrome control charges. In contrast to airports, charges on air traffic are the prevailing source of income for air navigation services providers, accounting in general for more than 95 per cent of the total income per State.

3.24 During 2002 a number of air navigation services providers experienced similar effects to airports in terms of loss of revenues from air navigation services charges due to

reductions in air traffic and aircraft movements. The effects on air navigation services providers of a decline in air traffic are particularly difficult to manage as the fixed costs are extremely high and any possible cost reduction measures would most likely affect future capacity. With less air traffic, providers of air navigation services would normally need to increase the air navigation services charges as the charges for the following year are calculated by dividing the cost of the service by the number of flights. In this context, when increases in charges are contemplated there should, according to ICAO's policies on airport and air navigation services charges, be a balance between the respective interests of airports and providers of air navigation services on one hand and of air carriers on the other, particularly during periods of economic difficulty. As a result of the decrease in air traffic during 2002 some commercialized air navigation services providers had to approach their governments in order to secure funds for their continued operations.

3.25 The share which route facility charges represent of total airline operating expenses increased from 2.4 per cent in 1992 to a peak of 3 per cent in 1998. Most of that increase is explained by the growing number of States levying air navigation services charges and the efforts of States already levying such charges to recover a higher share of their costs of providing air navigation facilities and services, including costs for meteorological services. After 1998 the share was reduced to 2.8 per cent in 2000 and to 2.5 per cent in 2001 (preliminary data). Again this relative decline is partly explained by an increase in other cost items, in particular aircraft fuel and oil costs.

Communications, navigation and surveillance

3.26 Implementation of communications, navigation, surveillance/air traffic management (CNS/ATM) systems continued. The first phase of the controller-pilot data link communications programme in the United States was successfully implemented in 2002, and the service is currently available over VDL Mode 2/ATN in the Miami en-route air traffic control centre. An almost global network for data link communications over high frequencies (HF) is operational. Air Traffic Services Message Handling Service has been implemented in Spain and Thailand, and it is being developed for operational use in Asia, Europe and the United States.

3.27 Significant progress continued in a number of States and international organizations on global navigation satellite system (GNSS) development and implementation. The ICAO GNSS Panel completed development and validation of the first package of Standards and Recommended Practices (SARPs) for GNSS. Further work included the initial development of SARPs for global positioning system (GPS) second civil frequency (GPS L5), GLONASS-M and for a new civil satellite navigation system to be developed in Europe, known as Galileo.

3.28 Development continued of satellite-based augmentation systems (SBAS), known as EGNOS in Europe, MSAS in Japan and WAAS in the United States. This form of augmentation has the potential to support the use of GNSS for all phases of flight down to Category I precision approach. Several architectures of ground-based augmentation systems (GBAS) which can support regional implementation options and have the potential to support Category II/III precision approach applications also continue to be developed and tested. This

type of augmentation will be used by some States as an alternative to SBAS in support of Category I operations. A number of States have approved the GPS for supplemental or primary use for some operations and types of airspace.

3.29 A number of multinational facilities and services have now been developed in line with ICAO worldwide provisions. Some of these, such as the world area forecast centres in London and Washington, the three ICAO satellite broadcasts known as SADIS (the satellite distribution system for information relating to air navigation), and the two international satellite communication systems, serve air navigation systems in all ICAO regions.

3.30 During 2002 preparations continued for the International Telecommunication Union (ITU) World Radiocommunication Conference (2003) (WRC-2003). Particular emphasis was placed on securing support for the ICAO position for WRC-2003 through participation in regional telecommunication organization activities and in ITU study groups and WRC preparatory activities.

3.31 The operational trials for the Mode S extended squitter as the data link for the Automatic Dependent Surveillance — Broadcast (ADS-B) continued in the US, Europe and Australia. The extended squitter has been identified as the ADS-B data link for the Asia/Pacific region and in the US and Europe.

Air traffic management

3.32 Air traffic control systems around the world continued to be updated as part of the evolutionary process leading to a fully integrated ATM system. In most cases, supporting CNS/ATM systems were being implemented incrementally as part of systems upgrades, with a view to achieving early benefits as well as meeting long-term objectives.

3.33 Several ATM operational concepts have been developed aimed at the progressive introduction of CNS technologies in support of seamless ATM systems. The organizations developing these concepts continued to cooperate closely toward a coordinated implementation of ATM systems. In 2002, the ICAO Air Traffic Management Operational Concept Panel finalized its work on the development of a global ATM operational concept for implementation of CNS/ATM systems. The first version of this operational concept was presented to ICAO's Air Navigation Commission in March 2002.

3.34 ICAO decided to convene its Eleventh Air Navigation Conference in September/ October 2003.

3.35 Progress continued with implementation of required navigation performance (RNP) airspace and the introduction of reduced separation minima based on RNP. There are now extensive areas of RNP 10 airspace in the Asia/Pacific Region. The major routes between Europe and South America are also RNP 10, and the expansion of RNP 5 routes is continuing in the Middle East. New separation minima for use in RNP 4 airspace and new lateral

separation minima for crossing traffic in oceanic airspace became applicable in November 2002. Planning is underway for the introduction of RNP 4 airspace in parts of the Asia/Pacific Region.

3.36 A reduced vertical separation minimum (RVSM) of 300 m (1 000 ft) above FL 290 has now been implemented in major parts of the North Atlantic, the Pacific, East and South-East Asia, Western Europe, the major Europe-to-South America routes, the Western Atlantic route and northern Canada. The introduction of RVSM in the Middle East and the western part of Asia is planned for November 2004. RVSM in the south of Canada and the domestic airspace of the United States is planned for January 2005.

Aerodromes

3.37 The newer generation of large aeroplanes entering commercial civil aviation to meet growing air traffic demands is having an impact on airport infrastructure. Consequently, airports are evolving in a commensurate manner. To facilitate States in this regard, Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* is updated periodically to keep pace with aircraft development. An ICAO Circular on the impact of the new large aeroplane, i.e. currently the Airbus A380, is being developed to assist States in their endeavours.

3.38 An ICAO study on airport pavement design and evaluation procedures for analysing complex loading by new larger aeroplanes with 6 or more wheels per main gear strut (e.g. Boeing 777 and the future Airbus A380) is nearing completion. The study was supported by two full-scale pavement testing projects in two States.

3.39 The new generation high passenger-carrying capacity aeroplanes such as the Airbus A380 will require an improved approach to emergency planning and response. Since these aeroplanes are likely to have full-length upper decks, the adequacy of the quantities of extinguishing agents currently specified in Annex 14 — *Aerodromes*, Volume I, is being studied. Studies for identifying a suitable alternative to halons (halogenated hydrocarbons) as a complementary fire extinguishing agent continue.

3.40 Based on research and trials undertaken in States, studies are in progress for updating ICAO specifications on visual aids for navigation to reflect current technology. The studies include evaluation of light-emitting diodes (LED) technology. To ensure operational safety at airports, existing specifications on airfield ground lighting are being reviewed.

3.41 While there is a growing trend towards autonomy of airports in many parts of the world, the obligations of States with regard to ensuring the safety of civil aviation in their sovereign territory remain unchanged. In this context, many States need to develop appropriate legislation and regulations to be able to carry out safety inspections to ensure that airports continue to provide adequate and safe facilities and services. ICAO has introduced in Annex 14, Volume I, a new requirement for States to certify aerodromes in accordance with the applicable specifications and national regulations. A new *Manual on Certification of Aerodromes* (ICAO Doc 9774) has been published to help States meet their

obligations under the Convention on International Civil Aviation. As the certification of aerodromes used for international operations becomes mandatory from November 2003, and the requirement for safety management systems from 2005, a new manual on Safety Management Systems for Aerodromes and Air Traffic Services is being developed.

Aeronautical information and charts services

3.42 The objective of aeronautical information and charts (AIS/MAP) services is to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation. The role and importance of aeronautical information/data changed significantly with the implementation of modern, airborne computer-based navigation systems. The use of area navigation (RNAV) in the RNP environment depends on timely and high-quality aeronautical information/data. Corrupt or erroneous aeronautical information/data can potentially affect the safety of air navigation. For this reason, requirements for the quality system were introduced in Annex 15 — *Aeronautical Information Services* and further enhanced with an amendment in 2000. On that basis, many States have implemented or are working towards a properly organized quality system that contains procedures, processes and resources which would satisfy all the functional stages required in the origin and maintenance of aeronautical information/data.

3.43 To support the CNS/ATM systems, it is required that the AIS/MAP services provide quality aeronautical information to all users, anytime, anywhere. It would not be possible to achieve this very demanding AIS goal without automation. Developments in automation in both ground-based and airborne equipment, as well as the established requirements for quality aeronautical information, are increasing the need for the provision to users of aeronautical information/data in a common electronic exchange format. As a result, many States have already established aeronautical databases in their AIS/MAP services, or plan to do so, in order to meet the need for storing, accessing, transferring and archiving aeronautical information/data.

3.44 In the electronic environment, the generation and use of aeronautical information may involve many computer systems. To support and facilitate the use of aeronautical information contained in such systems, the requirement for international civil aviation is to be able to promulgate aeronautical information in a common, computer-interpretable form that will remain complete and consistent even when the information is exchanged among different computer systems. To meet these requirements, ICAO sponsored the development of a prototype Computerized Aeronautical Information Services (CAIS) System by an academic institution in the United States, starting in June 2001 and completed in April 2002. The prototype system has proven that it is capable of maintaining information contained in the aeronautical information publications (AIP) of all ICAO Contracting States in an electronic format, to be called an Aeronautical Data Package (ADP), as well as promulgating changes to the ADP to Contracting States in electronic format. The CAIS System will enable changes to be communicated to an ADP on a real-time basis, hence enabling all Contracting States and all other users to have unlimited access to up-to-date ADP information at all times from anywhere in the world.

3.45 To satisfy the requirements for the provision of quality aeronautical information to users in graphical form, new specifications for Annex 4 — *Aeronautical Charts* dealing with electronic aeronautical charts for cockpit display, symbology, the portrayal of terrain and minimum flight altitudes, airspace classes, air defence identification zones, and flight procedures and obstacle clearance based on RNAV systems were introduced in 2001. Further provisions for electronic aeronautical charts for cockpit display and the provision of electronic terrain data are under development by ICAO in consultation with industry. Bearing in mind that a quality system comprises procedures, processes and resources, due account is given to the development of new ICAO training guidelines for AIS/ MAP personnel based on the task analysis of AIS/MAP functions. New provisions for an AIS/MAP licence for inclusion in Annex 1 — *Personnel Licensing* are also under development.

Aeronautical meteorology

3.46 An increasing use by States of improved automatic meteorological observing systems has prompted requests for a review by ICAO of the role of these systems in the provision of observations for aviation. The use of meteorological information in the terminal area to support measures to increase airport capacity is being studied by States, in particular in the European Region. In this context, the development of a new meteorological report is being examined. Renewed interest has been shown in a number of States in conducting research on improving the quality and timeliness of forecasts of icing and turbulence.

3.47 Progress continued in the computer preparation of global forecasts of significant weather (SIGWX) by the world area forecast centres (WAFCs). As a result, high-level SIGWX charts for global coverage were prepared by means of interactive computer workstations by the WAFCs. Very small aperture terminals installed in more than 140 States receive data and products from the three ICAO satellite broadcasts. These broadcasts provide global world area forecast system (WAFS) forecasts and operational meteorological (OPMET) information, such as METARs, TAFs and SIGMETs, directly to States and users. The implementation of the satellite broadcasts and the provision of SIGWX forecasts by the WAFCs have permitted the closure of all the 15 regional area forecast centres.

3.48 Work continued in States responsible for Volcanic Ash Advisory Centres to develop and issue graphical volcanic ash advisories for provision to area control centres and meteorological watch offices.

Search and rescue

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

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

3.50 The system continued to expand its capability. As of 1 November 2002, there were seven low-altitude and three geostationary satellites (plus three in-orbit spares) in operation. At year's end, 38 local user terminals (LUTs) serviced the low altitude satellite and nine serviced the geostationary satellites. Twenty-three mission control centres (MCCs) were in operation. Although global coverage was already provided on 406 MHz, the growing number of LUTs and MCCs increased the real-time coverage of the system and reduced overall response time. The geostationary component of the system provided for almost instantaneous alert between approximately 70° North and 70° South. Over 284 000 distress beacons operating at 405 MHz and 680 000 of the older generation 112.5 MHz beacons were in service at the beginning of 2002.

3.51 Since it began trial operations in September 1982, the COSPAS-SARSAT system has contributed to the rescue of over 14 250 persons in over 4 100 aeronautical, maritime and terrestrial distress situations.

Controlled flight into terrain (CFIT)

3.52 In January 2002, ICAO wrote to States reiterating the need for implementation of the ICAO prevention of controlled flight into terrain (CFIT) and approach and landing accident reduction (ALAR) programmes.

3.53 Amendments to Annex 6, Parts I and II, adopted in 2002 included Standards requiring turbine-engined aeroplanes of a maximum certificated take-off mass (MCTM) in excess of 5 700 kg or authorized to carry more than nine passengers to be equipped with a ground proximity warning system (GPWS) which has a forward looking terrain avoidance function (TAWS Class A), with applicability dates of 1 January 2004 for new aeroplanes and 1 January 2007 for retrofit. A similar requirement was introduced for piston-engined aeroplanes (TAWS Class B) with an MCTM in excess of 5 700 kg or authorized to carry more than nine passengers. A new Recommended Practice to have turbine-engined aeroplanes of an MCTM of 5 700 kg or less and authorized to carry more than five, but not more than nine, passengers equipped at the TAWS Class B level was also introduced.

Flight safety and Human Factors

3.54 The first Threat and Error Management (TEM) Workshop was held in San Salvador, El Salvador, from 30 April to 1 May with the objective to present state-of-the-art industry knowledge of TEM training. A Human Factors and Safety in Airline Operations Conference was held in Havana, Cuba, from 11 to 15 March.

3.55 The second ICAO regional seminar on the Line Operations Safety Audit (LOSA) was held in Dubai from 14 to 16 October. LOSA is an emerging methodology to collect safety information by routine monitoring of normal airline operations.

Training

3.56 Since January 2002, two centres have joined the TRAINAIR programme, bringing the total number of members to 39. The course development activities of the member civil aviation training centres continued to expand. As of June, 134 Standardized Training Packages (STPs) were either completed or under development by members.

Chapter 4
User and Public Interest

4.1 This chapter reviews the levels of safety and security in air transport in 2002, efforts during the year to improve compensation for passengers involved in aircraft accidents, and air transport aspects of the broader social issues of environmental protection and aviation medicine.

SAFETY

4.2 The aircraft accidents covered under the heading "Safety" exclude incidents caused by acts of unlawful interference, which are shown under the section on Security.

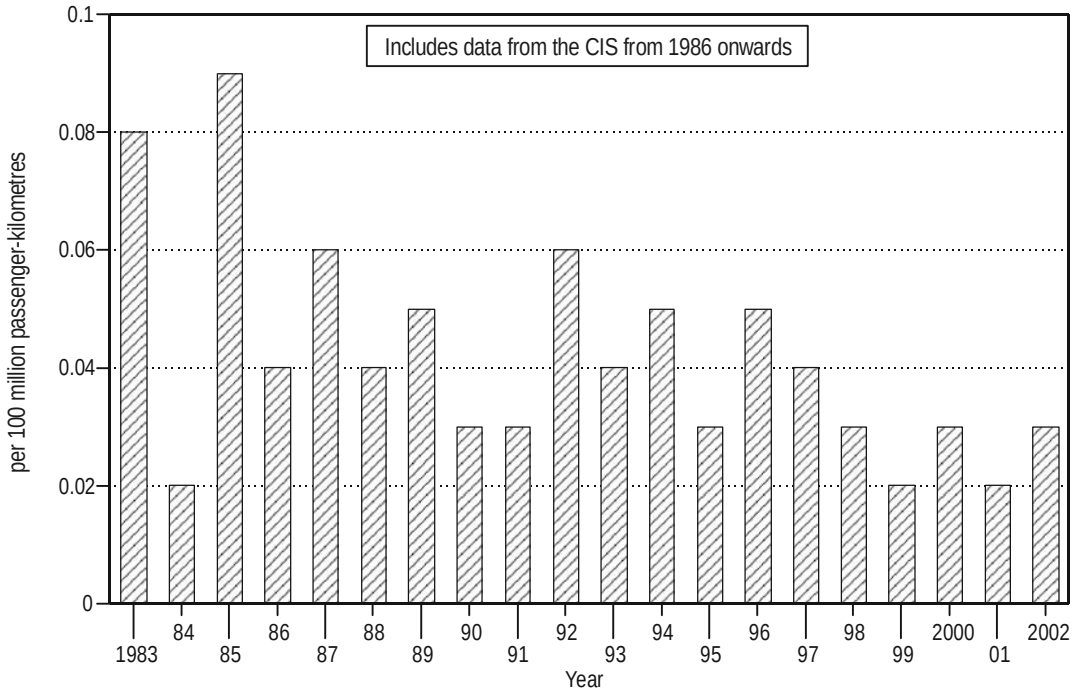
Scheduled operations

4.3 Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services worldwide shows that in 2002 there were 14 aircraft accidents with passenger fatalities involving aircraft with a certificated maximum take-off mass of more than 2 250 kg (including one aircraft operating all-cargo services with one passenger on board). The number of passenger fatalities involved was 791. This compares with 13 fatal accidents and 577 passenger fatalities in 2001 (Table A2-3). Between 2001 and 2002 there was almost no change in traffic, hence the number of passenger fatalities per 100 million passenger-kilometres increased to 0.025 from 0.02 in 2001. Similarly, the number of fatal aircraft accidents per 100 million aircraft-kilometres flown increased to 0.06 from 0.05 in 2001 and the number of fatal aircraft accidents per 100 000 landings increased to 0.07 from 0.06 in 2001 (Figures 4-1 to 4-3).

4.4 The safety levels are significantly different for the various types of aircraft operated on scheduled passenger services. For instance, in turbojet aircraft operations, which account for about 98 per cent of the total volume of scheduled traffic (in terms of passenger-kilometres performed), there were 7 accidents in 2002 with 704 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 2 per cent of the scheduled traffic volume, there were 7 accidents with 87 passenger fatalities. The fatality rate for turbojet aircraft operations was, therefore, far lower than for propeller-driven aircraft (Figures 4-1 to 4-3).

Non-scheduled commercial operations

4.5 Non-scheduled commercial operations include both the non-scheduled flights of scheduled airlines and all air transport flights of non-scheduled commercial operators. Data



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

Figure 4-1. Passenger fatalities per 100 million passenger-kilometres on scheduled services (1983–2002)

available to ICAO on the safety of non-scheduled passenger operations show that there were 19 accidents involving passenger fatalities on aircraft with a maximum certificated take-off mass of more than 2 250 kg in 2002 (including 3 aircraft operating all-cargo services with passengers on board) compared with 29 in 2001. These accidents accounted for 201 passenger fatalities in 2002 compared with 204 in 2001.

4.6 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 accidents involving 121 passenger fatalities in 2002.

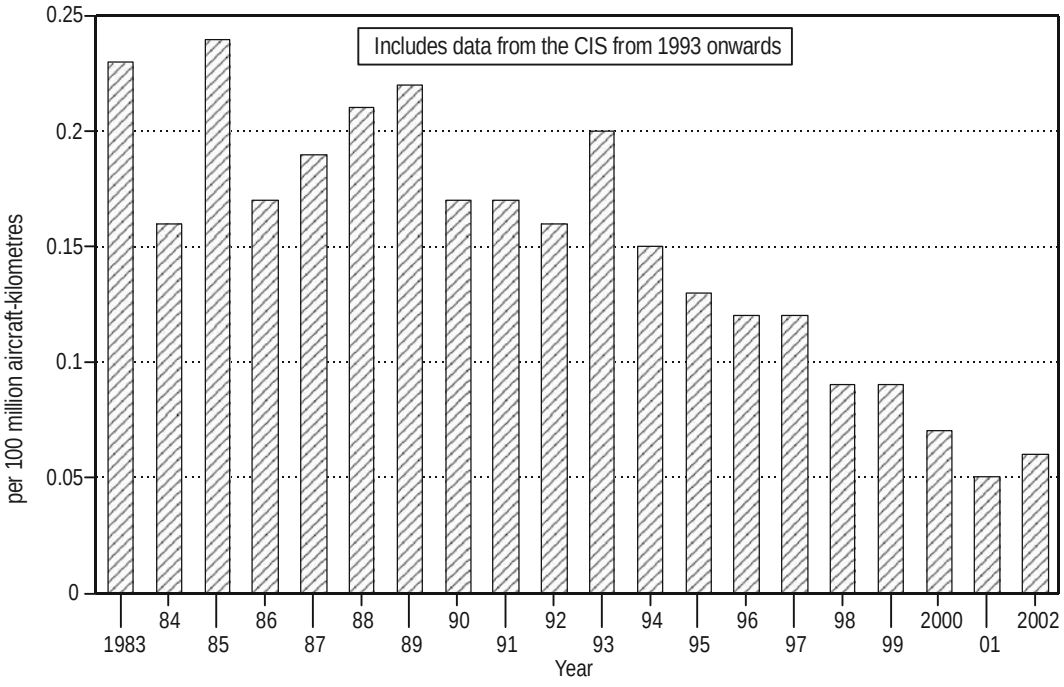
Safety oversight

4.7 The ICAO Universal Safety Oversight Audit Programme (USOP), established in 1999, continued its audit activities in 2002. By the end of the year, 180 Contracting States and five territories had been audited.

4.8 In accordance with Assembly Resolution A33-8, ICAO continued conducting audit follow-up missions, with sixty-seven of them completed by the end of 2002. These missions are designed to validate the implementation of the corrective action plans submitted by audited States, to identify any problems encountered by States in such implementation, and to determine the need for external assistance to resolve specific safety concerns.

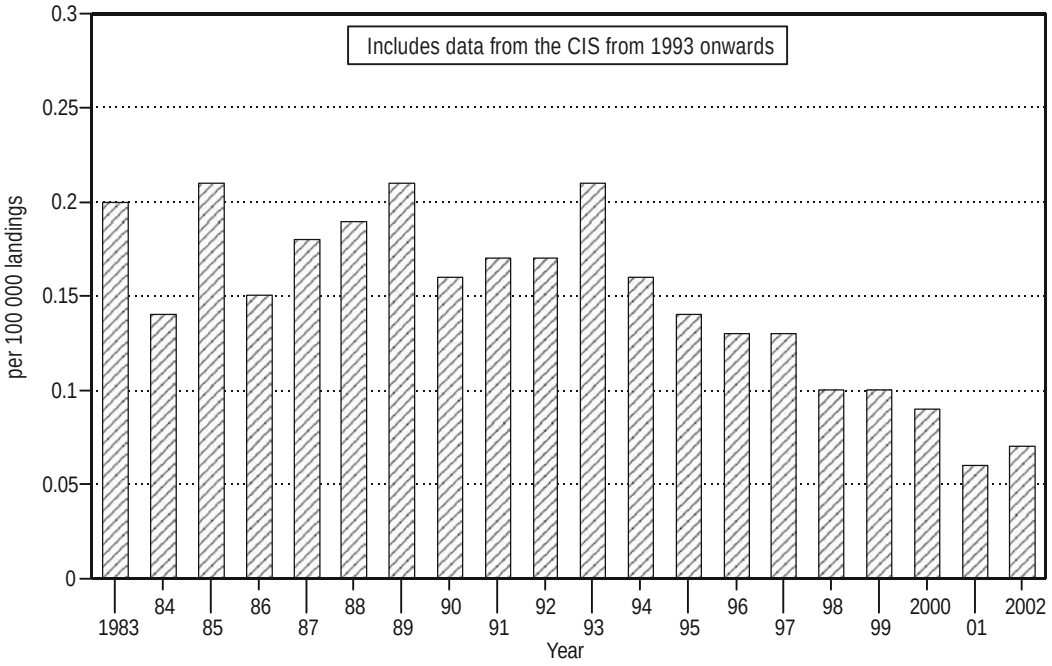
4.9 The analysis conducted through an Audit Findings and Differences Database (AFDD) has enabled the identification of safety oversight related deficiencies and the prioritization of actions required to resolve safety concerns at a global, regional, State or group-of-States level. Data gathered in the course of the follow-up missions is also entered in the AFDD in order to keep track of the status of implementation of States' corrective action plans and to update the information on the level of implementation of the critical elements of a State's safety oversight system.

4.10 The ICAO USOP will be expanded to cover Annex 11 — *Air Traffic Services,* Annex 13 — *Aircraft Accident and Incident Investigation* and Annex 14 — *Aerodromes.* Audits of Contracting States in these areas will begin in 2004.



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

Figure 4-2. Fatal accidents per 100 million aircraft-kilometres flown on scheduled services (1983–2002)



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

Figure 4-3. Fatal accidents per 100 000 landings by aircraft on scheduled services (1983–2002)

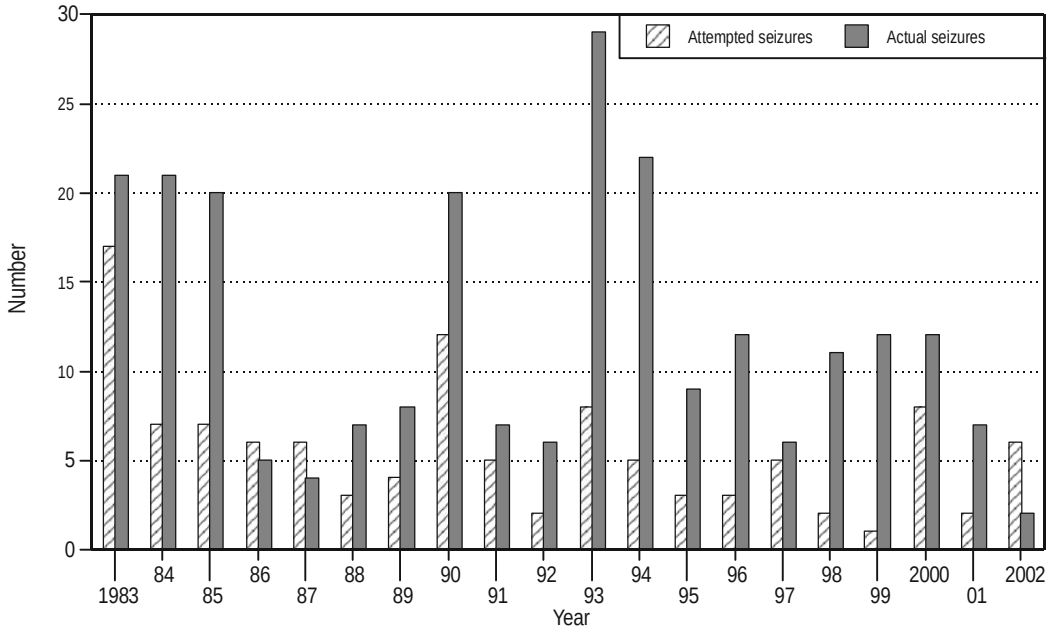
SECURITY

4.11 Following the events of 11 September 2001 in the United States, when for the first time aircraft were used as weapons of mass destruction, the aviation security community made major efforts in 2002 to re-evaluate and update the policies and measures that are in place to prevent acts of unlawful interference.

4.12 In February 2002, ICAO held a High-level, Ministerial Conference on Aviation Security where Contracting States gathered to assess the state of the air transport industry and to consider several actions for strengthening aviation security. The Conference endorsed a global strategy which includes an *Aviation Security Plan of Action* focusing on regular, mandatory, systematic and harmonized audits to enable the evaluation of the aviation security in place in all Contracting States. In addition to the security audits, the Plan of Action also addresses the following areas: identification, analysis and development of an effective global response to new and emerging threats; integration of measures to be taken in specific fields, including airports, aircraft and air traffic systems; strengthening of the security-related provisions in the Annexes to the *Convention on International Civil Aviation*, notably to protect the flight deck; close coordination with audit programmes at the regional and sub-regional levels; and a follow-up programme to assist with the rectification of identified deficiencies.

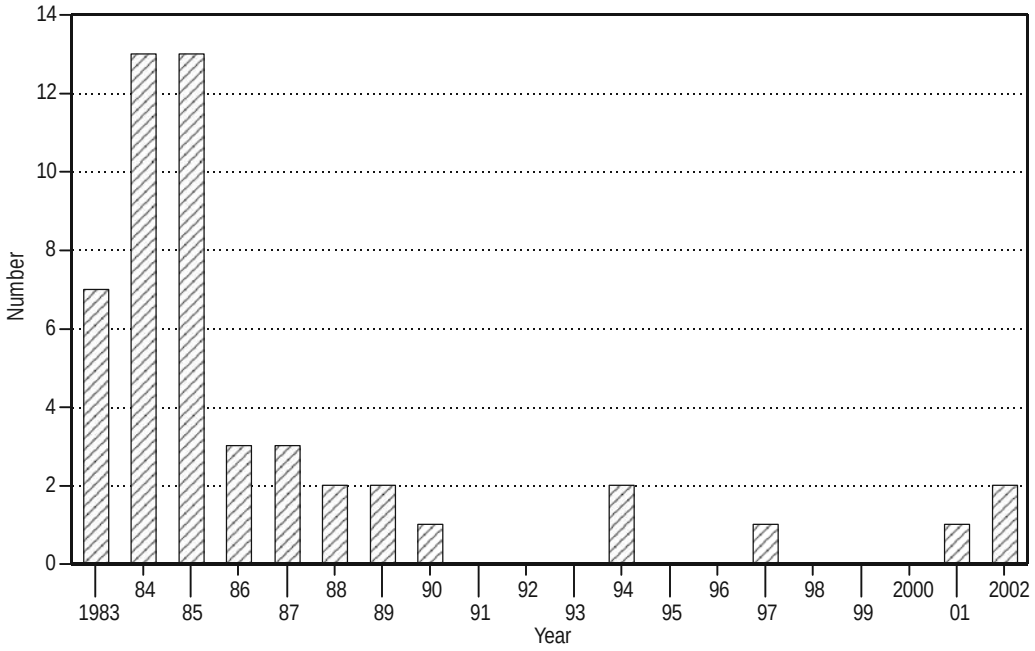
4.13 Many States have responded to the events of 11 September 2001 by implementing increased security measures to protect their airports and aircraft against acts of unlawful interference and to mitigate the impact of such attacks on the air transport industry as a whole. In general, enhanced security measures have been implemented at airports worldwide. These include tightening of passenger and baggage screening and other security procedures as well as deployment of more advanced airport security equipment. Increased security measures on aircraft have also been introduced, with the focus on cockpit and cabin security, such as deployment of armed security personnel on board, locking and reinforcement of cockpit doors to prevent unauthorized intrusion and, in some cases, the arming of flight crew.

4.14 In November 2002, the first audit took place under the ICAO Universal Security Audit Programme (USAP). The audit programme aims at identifying deficiencies in each State and providing suitable recommendations for their resolution. By following standardized auditing principles and protocols, aviation security audits are conducted at the national level and, on a sample basis, at the airport level. These audits address the organizational structures and procedures established by the appropriate State authority to ensure the sustainable implementation of its security system, as well as the effective implementation and enforcement of Annex 17. The cooperation of States being audited constitutes a key element for the effective implementation and success of the audit programme, despite its mandatory nature.



Source: ICAO database based on official reports from ICAO Contracting States.

Figure 4-4. Acts of unlawful seizure (1983–2002)



Source: ICAO database based on official reports from ICAO Contracting States.

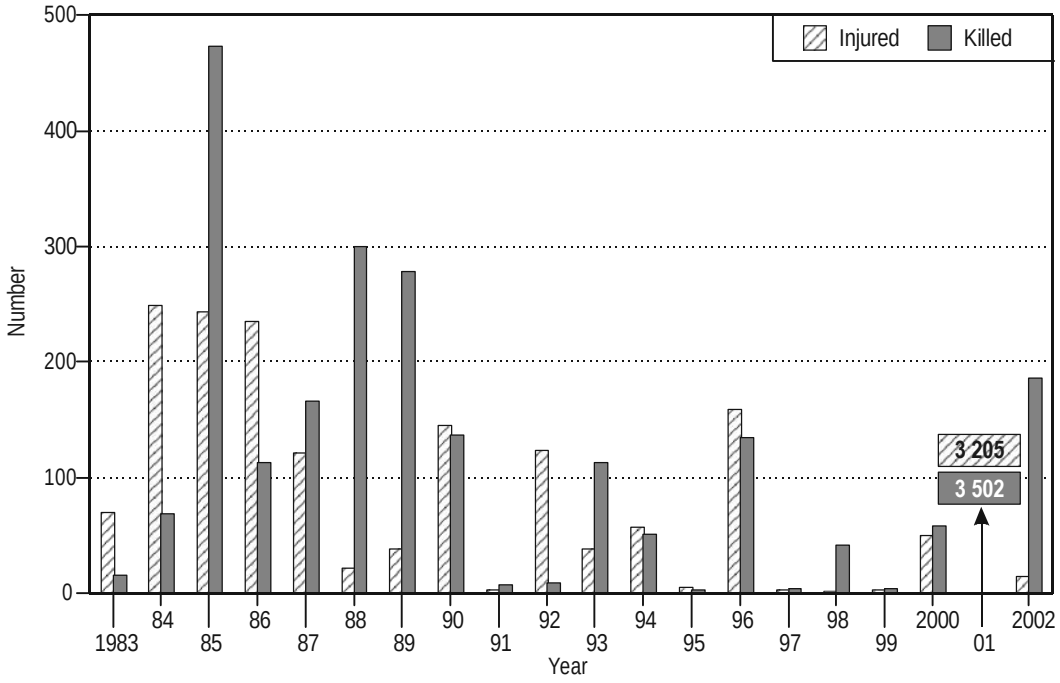
Figure 4-5. Incidents of sabotage (1983–2002)

4.15 In the year 2002, twenty-two acts of unlawful interference were recorded. These acts were two unlawful seizures, six attempted seizures, eight facility attacks, two attempted facility attacks, one in-flight attack, two acts of sabotage and one unlawful act against the safety of civil aviation. Developments in acts of unlawful interference since 1983 are shown in Figures 4-4 to 4-6 and in Appendix 1, Table A1-4.

AIR CARRIER LIABILITY

Status of ratification of the Montreal Convention of 1999

4.16 By the end of 2002 the *Convention for the Unification of Certain Rules for International Carriage by Air*, done at Montreal on 28 May 1999, had been ratified or otherwise accepted by 26 States. The Convention requires thirty ratifications in order to enter into force.



Note.— Official reports received regarding 11 September 2001 in the United States did not include the estimated number of deaths and injuries on the ground. Totals were current estimates obtained from media sources.

Source: ICAO database based on official reports from ICAO Contracting States and other sources.

Figure 4-6. Number of persons killed or injured in acts of unlawful interference (1983–2002)

War risk insurance coverage for third-party liability

4.17 Following the events of 11 September 2001, the international insurance market cancelled, effective 24 September 2001, the then existing coverage for airline operators and other service providers against losses and damages arising from acts of war, hijacking and other related perils (war risk insurance). The coverage was subsequently reinstated to a very limited extent and on the basis of significantly increased premiums, ultimately resulting in considerable gaps as regards insurance coverage for third-party liability (death and personal injury, property damage on the ground).

4.18 Realizing that these developments seriously threatened the viability of international air transport operations worldwide, ICAO, IATA and other interested parties urged governments to step in and make a commitment to cover the risks left open by the above circumstances until such time as the insurance markets stabilize. A large number of States made such a commitment in the form of financial guarantees and reinsurance facilities, but these arrangements were temporary in nature, varied in scope and implementation, and demanded a more coordinated and uniform solution to this problem.

4.19 To this end, the international aviation community is considering a proposal which was developed by a Special Group established under the auspices of ICAO. This proposal provides for the establishment of an international mechanism in the form of a non-profit insurance entity for the sole purpose of offering third-party war risk liability coverage in excess of the presently available limits, up to the amount of $1.5 billion per insured, per occurrence, per aircraft. Claims under the scheme would be met through accumulated premiums collected by airlines, while participating governments would act as guarantors of last resort only. The ICAO Council has considered the proposal and has approved, in principle, the establishment of this Global Scheme, including a draft Participation Agreement to be signed by participating States.

FACILITATION

Machine Readable Travel Documents

4.20 Recent years have seen a marked increase in the use of ICAO's Doc 9303 specifications for the issuance of travel documents in machine-readable form. Over 100 of ICAO's 188 Contracting States now issue Machine Readable Passports (MRPs) or are planning to do so soon. Around 25 States issue Machine Readable Visas (MRVs) and about the same number have indicated their intention to do so by 2003/04. Fifteen States issue machine-readable travel cards, and an equal number hope to do so in the near future. The use of machine readers at borders has increased. Forty-two States have installed readers, and an additional thirty-five States intend to have readers in place within the latter half of the decade.

4.21 These statistics reflect a marked expansion of participation by States in a global strategy to improve border clearance processes by applying advanced technology. Moreover, it is important to note that a substantial portion of this activity is taking place in developing and emerging States. Motivated by the need to improve the security of travel documents and the integrity of border-crossing procedures, more States than ever before are working on standardized, interoperable solutions to cope with the projected increases in traffic volumes.

4.22 The next major development now emerging is the incorporation of biometric technology in travel documents and inspection systems for purposes of authentication of documents and confirmation of traveller identity.

Modern clearance controls

4.23 The present climate of intensive security controls calls for new approaches to border control and aviation security. Increased congestion and lengthened processing times caused by the sudden imposition of unfamiliar procedures can be counterproductive to security. These also cause confusion and disorder that can be exploited by those seeking to evade inspection. Increases in traditional control measures also tend to have a negative economic impact. This is especially so, to a disproportionate extent, in developing countries where the economy is more sensitive to the flow of trade and may not be robust enough to absorb the costs resulting

from delays and distortions. New security regimes at ports and airports in some of the more advanced States, requiring increased amounts of advance data to be submitted on persons and goods, also impose added costs which may erode profit margins in States which did not previously have the necessary systems in place.

4.24 The worldwide reform and modernization of control systems has become an urgent international responsibility. Applications of technology and risk management to facilitate traffic flows and the harmonization of inspection protocols are essential, not just for reasons of easier and more equitable trading, but also as a primary factor in reconciling global economic expansion with safer and more efficient border management.

Invasive alien species

4.25 An issue which has recently come into the spotlight is the global problem caused by invasive alien species (IAS). These are species which, after having been relocated outside their natural range, establish themselves in their new environment and threaten species native to that environment. These "bioinvasions" cause extensive damage to biodiversity, and it is estimated that the financial damage to agriculture, horticulture and similar industries and trades can run into billions of dollars.

4.26 Species "relocate" by hitch-hiking on ships, aircraft and railway cars, on goods and in containers carrying these goods. The IAS problem is well known in maritime transport. Every day, hundreds of species from one part of the world are carried, for example, in ships' ballast water to other parts of the world. To what extent species are introduced into new environments through the international air transport pathway is less well known.

4.27 Air cargo, in particular, is an opportune conduit for the unintentional transport of tiny creatures such as microbes and insects, and possibly larger plants and animals as well, that could become invasive after arrival in a new environment. As international traffic volumes expand, so does the potential for new invasions. A study currently underway in ICAO is seeking specific data which would help determine the extent to which international civil aviation is a pathway for the introduction of invasive alien species and what types of strategies should be developed to address the problem.

ENVIRONMENTAL PROTECTION

4.28 In 2002, the aviation community continued to address the environmental problems associated with aircraft noise and with both the global and local impact of aircraft engine emissions.

Aircraft noise

4.29 The phasing out of operations by so-called Chapter 2 aircraft (subsonic jet aircraft that meet the noise certification levels in ICAO Annex 16, Volume I, Chapter 2, but exceed

those in Chapter 3) continued in accordance with the policy framework established by the ICAO Assembly in 1990. In a number of States, the phase-out was completed on 1 April 2002.

4.30 Following the endorsement of the concept of a balanced approach to noise management by the ICAO Assembly in 2001 (Assembly Resolution A33-7), ICAO is developing guidance material to assist States in implementing the balanced approach. This consists of four principal elements, namely, noise reduction at source (quieter aircraft), land-use planning and management around airports, noise abatement operational procedures, and operating restrictions.

4.31 The ICAO Assembly in 2001 had also resolved the difficult question of operating restrictions on the noisiest Chapter 3 aircraft by giving guidance on the process to be followed to States needing to introduce such restrictions at airports with severe noise problems. In the light of this agreement, legislation was adopted in Europe enabling the introduction of such restrictions (Directive 2002/30/EC of the European Parliament and of the Council of 26 March 2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports).

Aircraft engine emissions

4.32 According to a special report on *Aviation and the Global Atmosphere* prepared by the Intergovernmental Panel on Climate Change in 1999 at ICAO's request, aircraft emit gases and particles which alter the atmospheric concentration of greenhouse gases, trigger the formation of condensation trails and may increase cirrus cloudiness, all of which contribute to climate change. Aircraft are estimated to contribute about 3.5 per cent of the total radiative forcing (a measure of change in climate) by all human activities. This percentage excludes the effects of possible changes in cirrus, and it is projected to grow primarily because of aviation's rapid rate of growth. Although improvements in aircraft and engine technology and in the efficiency of the air traffic system will bring environmental benefits, these are not expected to fully offset the effects of the increased emissions resulting from the projected growth in aviation.

4.33 Policy-making regarding aircraft engine emissions is being given increased attention by States following the adoption in December 1997 of the *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (UNFCCC), which included a provision that developed countries, working through ICAO, shall pursue limitation or reduction of greenhouse gases from aviation bunker fuels. During the year, ICAO's work on emissions continued to address both global and local concerns, but with particular focus on developing policy options to limit or reduce greenhouse gas emissions so as to be able to provide advice as soon as possible to the Conference of the Parties to the UNFCCC. Special emphasis was placed on the use of technical solutions. These include monitoring advances in technology, exploring the further development of emissions standards (ICAO Annex 16, Volume II), notably the permitted levels for oxides of nitrogen (NO_x), and promoting operational measures aimed at reducing fuel burn and emissions. ICAO is also continuing to develop guidance for States on the application of market-based measures such as voluntary agreements, emissions trading and emissions-related levies (charges or taxes).

AVIATION MEDICINE

Smoking restrictions

4.34 The implementation of a complete ban on smoking on all international flights in accordance with ICAO Assembly Resolution A29-15 which had called for a 1 July 1996 deadline was still not achieved by the end of 2002, but considerable advancement towards this goal had been made, both by legislation and by airline policies, and further progress is to be expected. As a measure of success of these efforts on certain markets, the United States Department of Transportation has reported that, by 1998, 100 per cent of non-stop scheduled United States airline flights between that country and foreign points were smoke-free and by the end of 2002, all Australian, New Zealand, Scandinavian and the vast majority of the European, African and Asian airlines were smoke-free net-wide.

Substance abuse

4.35 In accordance with Assembly Resolution A33-12 on *Harmonization of drug and alcohol testing programmes*, ICAO distributed a State letter in March 2002 encouraging Contracting States to foster consistency with respect to their prevention programmes, in particular with regard to substance testing programmes and enforcement.

Traveller's thrombosis

4.36 The intense media interest in the possible association between air travel and deep vein thrombosis continues. The WRIGHT Project, a scientific study to ascertain whether such a link is real, launched in 2001 by the World Health Organization and ICAO is steadily progressing. This research project is expected to be completed in 2005.

TECHNICAL CO-OPERATION

Recruitment of field personnel

4.37 ICAO's Technical Co-operation Bureau (TCB) employed 418 experts from 40 countries on projects during all or part of 2002. Some of these experts were employed in two or more programmes during the year. The figures in this paragraph therefore total 422 instead of 418. There were also 7 United Nations Volunteers and 604 National Professionals in the TCB Programme.

Fellowships training

4.38 During the year 2002, 428 fellowships were awarded to staff of Civil Aviation Departments of developing countries through the ICAO Fellowships Programme. The

Programme was almost entirely funded by developing countries themselves, reflecting their commitment to train their own civil aviation staff and fill the gap created by the continuing decline in traditional United Nations Development Programme (UNDP) funding of human resource development in the civil aviation sector.

4.39 Furthermore, 248 fellows, or 62.9 per cent of the total 394 fellowships implemented, attended courses in training centres in developing countries that were established or expanded with the cooperation of ICAO, while the remaining 146, or 37.1 per cent, were trained at other training centres throughout the world. The average duration of a fellowship was 0.7 months.

Purchase of equipment

4.40 During the year 2002, 488 purchase orders and contracts were issued, representing total commitments of US$39.16 million. The procurements include 391 purchase orders and contracts worth US$34.25 million for the Technical Co-operation Programme. Meanwhile, procurement under the Civil Aviation Purchasing Services (CAPS) continued to attract interest with 7 more countries subscribing to this plan, bringing the total number of participating countries to 96.

PART II

WORLD OUTLOOK TO 2005

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Chapter 5
Global Trends and Forecasts

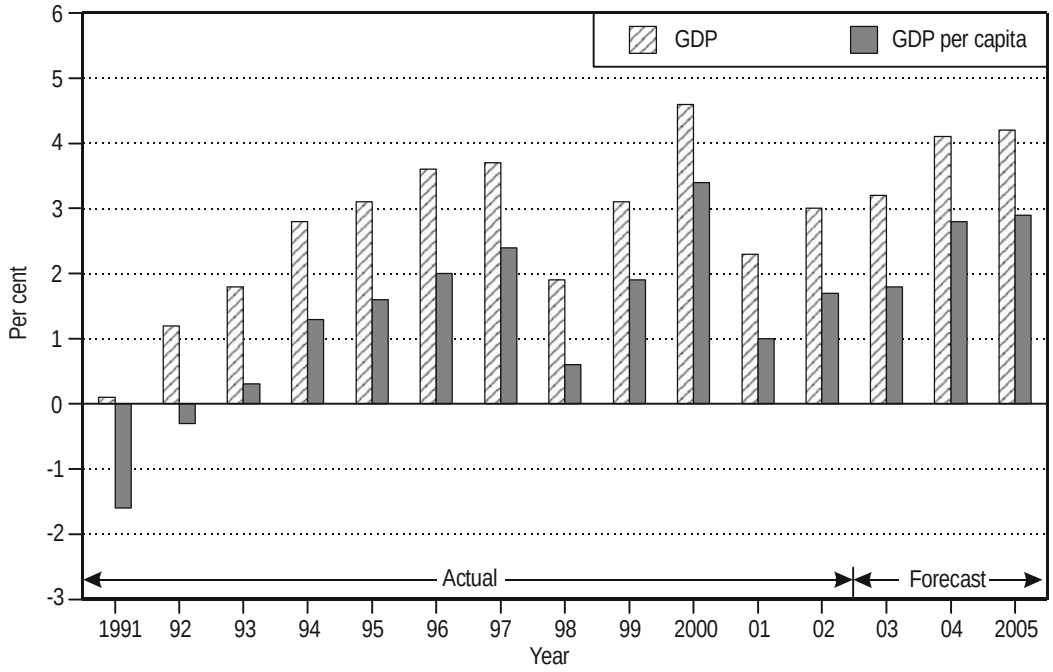
5.1 This chapter reviews historical developments in the world economy for the period 1991-2001 and anticipated developments through to 2005; examines trends in airline traffic, productivity, prices and finances; and presents airline scheduled passenger traffic forecasts and, to the extent possible, airline financial forecasts, through to 2005.

ECONOMIC TRENDS

5.2 The demand for air passenger travel is primarily determined by income levels, 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 1991 and 2001, the aggregate world economy measured in terms of GDP grew at an average annual rate of 2.8 per cent in real terms. Growth rates varied across regions, from a high of 3.9 per cent for Asia/Pacific and the Middle East to a low of 1 per cent for Europe including the "countries-in-transition" in Eastern Europe and the CIS (see Chapter 6 for further details). The world population increased between 1991 and 2001 at an average annual rate of 1.4 per cent. Hence, the world's GDP per capita increased during the same period at an average annual rate of 1.4 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 slowdowns in Germany and Japan. In addition, the former centrally planned economies of Eastern Europe and the CIS 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. In 1998 the world economy experienced some slowdown resulting from the financial crisis in several Asian countries, but in 1999 it experienced a rebound and posted a 3.1 per cent growth. The economy continued to grow in 2000, by 4.7 per cent, but experienced a slowdown in growth in 2001 in almost all major regions. This slowdown was accompanied by a marked decline in trade growth, significantly lower commodity prices, and deteriorating financing conditions in emerging markets. The events of 11 September 2001 amplified the impact on consumer and business confidence, demand and activity, particularly in the United States. Consequently,



Source: IMF, WEFA Group.

Figure 5-1. Annual change in real GDP and GDP per capita — World (1991–2005)

the global economy grew by only 2.3 per cent in 2001. In 2002, with trade and industrial production improving across all regions, the world economy recovered to grow at a rate of 3 per cent.

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. However, the economies of Latin America, Africa and the Middle East have all had significant periods of difficulty and low growth during the past decade. Structural reform and the sustained implementation of prudent macroeconomic policies together with large capital inflows supported consistently strong growth in East and South-East Asia through to 1997 when there were substantial financial and economic setbacks in several countries. The slowdown in the aggregate GDP growth of developing countries from 5.8 per cent in 1997 to 3.2 per cent in 1998 resulted primarily from contractions in output in several South-East Asian countries and a weakening performance in Latin America and the Caribbean. The economic performance of developing countries amounted to about 3.9 per cent GDP growth in real terms in 1999 and 5.7 per cent in 2000. This reflects the consolidation of recovery in Asia and a rebound from slowdowns in emerging markets in Latin America and the Middle East. In 2001, developing countries and in particular the poorest countries were hurt by weaker external demand and falling commodity prices, with oil exporters being particularly affected. As a result GDP growth of developing countries declined to 3.9 per cent in 2001 from 5.7 per cent in the previous year. Economic growth recovered moderately in 2002 to reach 4.6 per cent, due mainly to a better economic environment and improvements in commodity prices.

5.6 On several occasions, 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 oil price increases has improved because of reduced energy dependency and the effects of structural reforms in the 1980s. Crude oil prices picked up in 1999 and especially 2000 when the crude oil price is estimated to have averaged about $28 a barrel, the highest level since 1989. Crude oil prices started to decline moderately in early 2001 with a further sharp decrease after the events of 11 September to end the year at about $19 a barrel; the price averaged out for the year at $25 a barrel. The downward trend reversed in 2002 with an average price of about $25.50 a barrel for the year with prices reaching $29 a barrel by December. Due to geopolitical uncertainties, crude oil prices remained volatile in the first five months of 2003; after increasing rapidly during the run-up to the war in Iraq, prices decreased markedly in April and May.

5.7 Oil price rises and accommodating monetary policies contributed to double-digit inflation in 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 per annum. During 2002, inflation in most industrial countries declined further to an aggregate rate of 1.5 per cent. Inflation rates in developing countries as a group continued to follow a similar overall declining trend; in 2002, a new low average rate of 5.4 per cent was achieved, although large variations prevailed from region to region and among countries within regional groupings.

5.8 After the 1998 slowdown, the world economy regained strength in 1999 and continued to expand in 2000, with growth of 4.7 per cent. However, the latter part of 2000 and the year 2001 witnessed a marked slowdown in all major regions. Following restored momentum in 2002, the latest trends show that the pace of recovery has slowed in the early part of 2003, particularly in industrial countries. The projections for global and regional economic growth that have been used as a basis for ICAO's air traffic forecasts over the period to 2005 are presented in Table 5-1. These regional and global assessments of the economic outlook take into account the most recent forecasts from the IMF, OECD, WEFA Group and the World Bank as well as the views of other organizations in both the governmental and private sectors.

5.9 It is projected that the economy of the United States will start to recover in 2003 and to expand further in 2004 and 2005. A weakness in internal demand, a tight fiscal policy and the appreciation of the EURO are anticipated to lead to lower growth in the EURO area.

5.10 Economic growth in the Asia/Pacific region is expected to remain solid in 2003, in spite of a repeatedly weak economic performance by Japan since 2001, and to maintain momentum through 2005. Having shown some resilience to geopolitical tensions and conflicts, the Middle East economy is expected to improve gradually through to the end of the forecast period. The African economy is also projected to improve in 2003 and particularly in 2004 and 2005. Having fallen into recession in 2001 and 2002, the economy of the Latin America and the Caribbean region is expected to improve in 2003 before recovering strength through 2004 and 2005. Chapter 6 provides further details on regional economic developments.

Table 5-1. Economic growth — World and regions (2001 – 2005)
(real average annual GDP growth rates, per cent)

Region	Actual 2001	Estimated 2002	2003	Forecast 2004	2005
Africa	3.6	3.4	3.7	4.5	4.6
Asia/Pacific	3.9	4.8	4.5	4.9	4.9
Europe	1.8	1.3	1.4	2.5	3.0
Middle East	3.9	3.9	4.0	4.4	4.3
North America	0.4	2.5	2.3	3.6	3.8
Latin America and Caribbean	0.6	-0.1	1.5	4.0	4.1
World	2.3	3.0	3.2	4.1	4.2

Source: ICAO estimates based on data from the IMF, OECD, WEFA Group, World Bank and other 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 4.9 per cent between 1991 and 2002. Passenger-kilometres grew at an average rate of 4.3 per cent per annum and freight tonne-kilometres at 6.5 per cent per annum. Global traffic data for each year of the period 1991-2002 are given in Tables 5-2 (total traffic) and 5-3 (international traffic).

5.12 In broad terms, the pattern of traffic growth over the1991-2002 period was a reflection of economic conditions experienced over this period. As depicted in Figure 5-2, in the middle of 1990 the relatively buoyant economic and air traffic performance enjoyed during most of the 1980s came to an end. 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 yield. Although real yields declined further in 1993 and 1994, the stimulating effect on traffic demand was less dramatic than in 1992. On the other hand, economic growth began to provide a more solid foundation for traffic growth. These trends continued until 1997 but reversed in 1998 when GDP grew at only 1.9 per cent, providing for a simultaneous growth of total scheduled passenger traffic of only 2.1 per cent. However, a strong economic performance resulted in 6.5 and 7.8 per cent traffic growth in 1999 and 2000, respectively. The economic downturn and the related decline in business and consumer confidence had a negative impact on traffic in late 2000 and in 2001, when the events of 11 September 2001 exacerbated an already difficult situation. While GDP grew moderately at a rate of 2.3 per cent in 2001, traffic declined by an estimated 2.9 per

Table 5-2. Total international and domestic revenue traffic — World (1991-2002) (scheduled services of airlines of ICAO Contracting States)

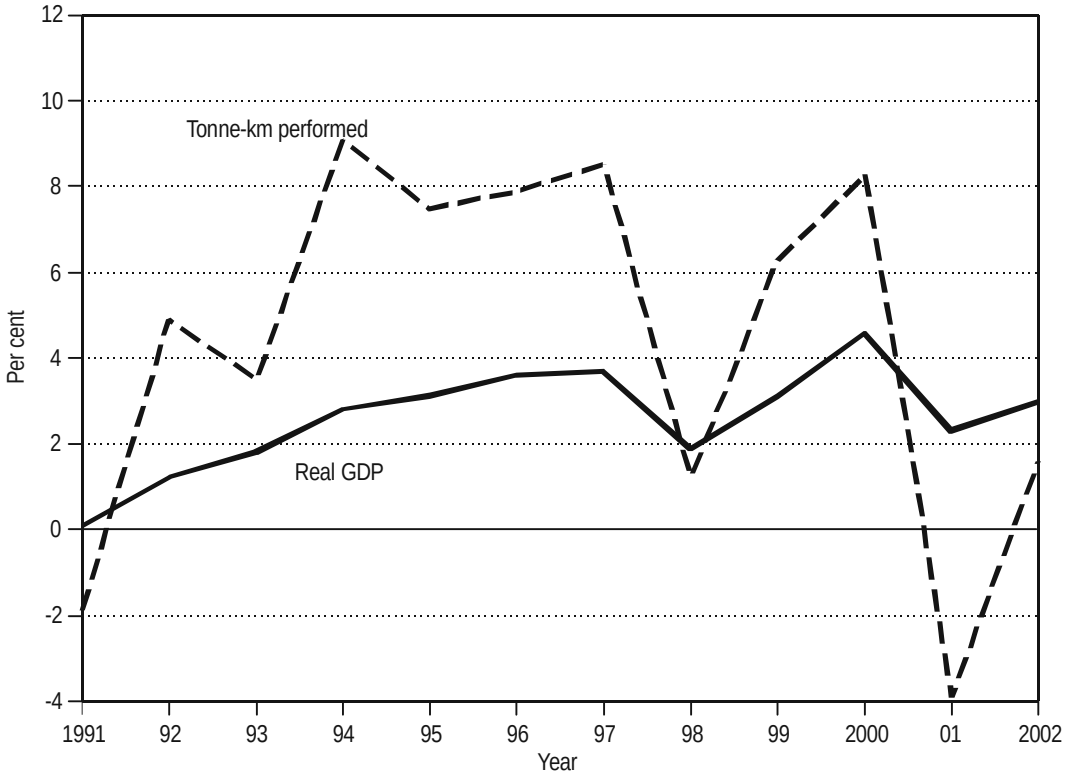
	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
Year	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1991	1 135	–2.6	1 845 420	–2.6	17.5	–4.9	58 560	–0.4	5 070	–4.9	230 720	–1.9
1992	1 146	1.0	1 928 920	4.5	17.6	0.6	62 640	7.0	5 130	1.2	242 140	4.9
1993	1 142	–0.3	1 949 420	1.1	18.1	2.8	68 450	9.3	5 230	1.9	250 630	3.5
1994	1 233	8.0	2 099 940	7.7	20.5	13.3	77 220	12.8	5 410	3.4	273 420	9.1
1995	1 304	5.8	2 248 210	7.1	22.2	8.3	83 130	7.7	5 630	4.1	293 930	7.5
1996	1 391	6.7	2 431 690	8.2	23.2	4.5	89 200	7.3	5 800	3.0	317 150	7.9
1997	1 457	4.7	2 573 010	5.8	26.4	13.8	102 880	15.3	5 990	3.3	344 190	8.5
1998	1 471	1.0	2 628 120	2.1	26.5	0.4	101 820	–1.0	5 760	–3.8	348 600	1.3
1999	1 562	6.2	2 797 800	6.5	28.1	6.0	108 660	6.7	5 720	–0.7	370 420	6.3
2000	1 656	6.0	3 017 350	7.8	30.2	7.5	117 960	8.6	6 050	5.8	401 170	8.3
2001	1 624	–1.9	2 929 850	–2.9	28.6	–5.3	110 700	–6.2	5 310	–12.2	385 450	–3.9
2002	1 615	–0.6	2 942 410	0.4	29.5	3.1	116 630	5.4	4 530	–14.7	391 790	1.6

Source: ICAO Air Transport Reporting Form A.

Table 5-3. International revenue traffic — World (1991-2002) (scheduled services of airlines of ICAO Contracting States)

	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
Year	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1991	266	–5.0	861 530	–3.6	8.5	–1.2	46 410	0.2	2 190	0.0	128 280	–1.9
1992	299	12.4	982 490	14.0	9.3	9.4	50 750	9.4	2 190	0.0	143 600	11.9
1993	319	6.7	1 047 380	6.6	10.3	10.8	56 050	10.4	2 200	0.5	155 490	8.3
1994	347	8.8	1 143 180	9.1	11.8	14.6	64 700	15.4	2 240	1.8	173 080	11.3
1995	375	8.1	1 249 160	9.3	13.0	10.2	70 340	8.7	2 400	7.1	189 430	9.4
1996	412	9.9	1 380 680	10.5	13.6	4.6	75 510	7.4	2 450	2.1	206 870	9.2
1997	438	6.3	1 468 150	6.3	15.7	15.4	87 740	16.2	2 490	1.6	227 390	9.9
1998	458	4.6	1 512 040	3.0	15.8	0.6	87 050	–0.8	2 480	–0.4	231 440	1.8
1999	493	7.6	1 622 250	7.3	17.3	9.5	93 280	7.2	2 480	0.0	247 610	7.0
2000	538	9.1	1 778 110	9.6	18.8	8.7	101 520	8.8	2 670	7.7	271 400	9.6
2001	532	–1.1	1 715 740	–3.5	18.0	–4.3	95 950	–5.5	2 660	–0.4	259 520	–4.4
2002	545	2.4	1 732 160	1.0	19.0	5.6	100 590	4.8	2 680	0.8	265 650	2.4

Source: ICAO Air Transport Reporting Form A.



Source: IMF, ICAO Air Transport Reporting Form A.

Figure 5-2. GDP and scheduled traffic growth — World (1991–2002)

cent, the first decline since 1991 and the second since 1945. In 2002, demand for air travel remained depressed and traffic grew barely at a rate of 0.4 per cent despite economic growth of 3 per cent.

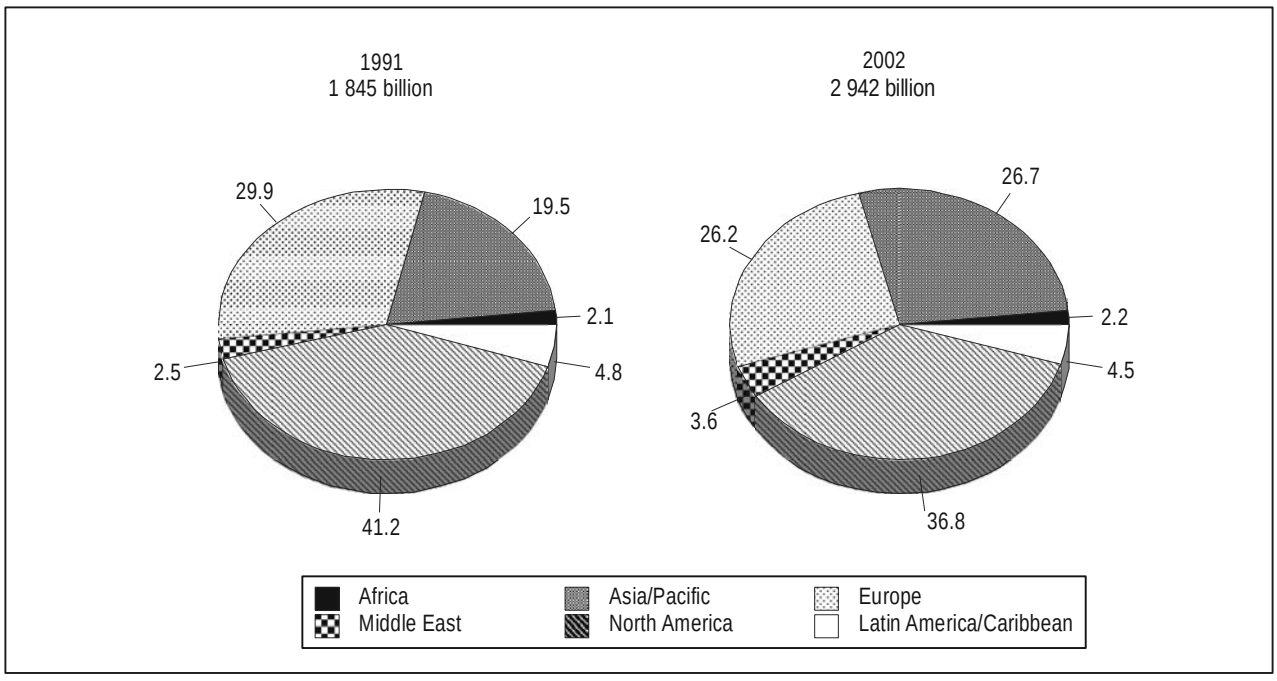
5.13 The regional distribution of scheduled passenger traffic for the years 1991 and 2002 is illustrated in Figure 5-3. The airlines of the North American and European regions dominate, together contributing 71.1 per cent to the total traffic in 1991, although this share had declined to 63 per cent by 2002. Passenger traffic performed by airlines registered in the Asia/Pacific region increased from 19.5 per cent of the total world traffic in 1991 to about 26.7 per cent in 2002. The remaining regions contributed 9.4 per cent of the traffic in 1991 and 10.3 per cent in 2002.

AIRLINE PRODUCTIVITY, PRICES AND FINANCIAL PERFORMANCE

5.14 The scheduled airline industry has a long history of improving productivity. As a result, the growth in the output of the industry (traffic volumes measured by tonne-kilometres

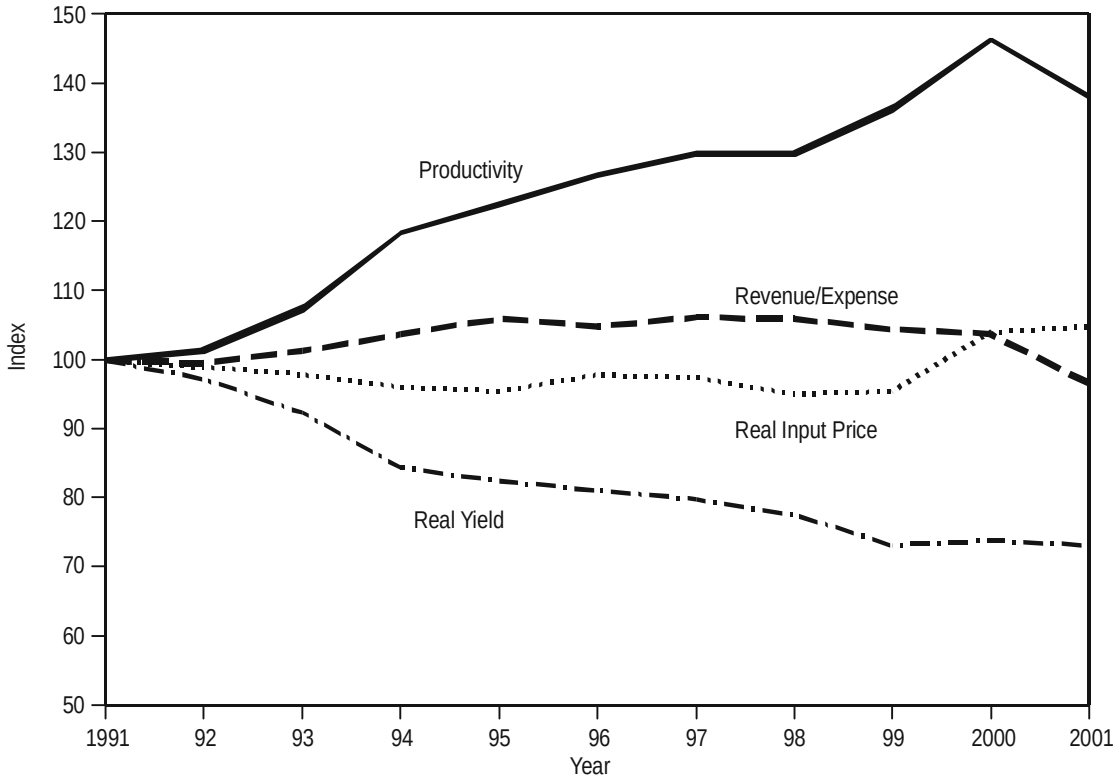
performed or TKP) has been greater than the growth in the various inputs used by the industry (mainly labour, fuel and aircraft). For the purposes of the present forecasts, separate partial productivity measures for labour (TKP per employee), fuel (TKP per tonne of fuel consumed) and aircraft (TKP per 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 1991 has been about 3.3 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. In 2001, however, productivity declined, reflecting the sudden output (TKP) contraction and the time lag needed for input adjustments as evidenced by flight cancellations, personnel and fleet reductions.

5.15 Improvements in productivity can, in principle, be used 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 ratio representing the financial performance of the scheduled airline industry. Expenses are defined here as operating expenses, excluding taxes and interest on



Source: ICAO Air Transport Reporting Form A.

Figure 5-3. Regional distribution of scheduled passenger traffic — World (1991 and 2002) (percentage of passenger-kilometres performed)



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

Figure 5-4. Trends in performance of the scheduled airline industry — World (1991–2001)

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 reductions in fuel prices). Real yields continued to decline even as real input prices increased in 2000. Real yields and real input prices were almost steady in 2001, and the decline in productivity translated into significant operational losses for the airlines.

5.16 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 1991 in operating revenues and expenses, the operating result (earnings before interest, other non-operating items and taxes) and the net result (earnings 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. In the early 1990s, demand weakened and the utilization of airline resources tended to decline. The emergence of excess capacity and

consequent competitive pressures depressed 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. Between 1994 and 2000, the airline industry continued to show positive operating and net results as shown in Table 5-4. In 2001, shrinking operating revenues, due to declining traffic combined with increasing fuel, security and insurance costs, led to an unprecedented operational loss of $11.8 billion and a net loss of $13 billion. According to preliminary estimates, this trend continued in 2002 but with a significantly lower operating loss of about $7.3 billion.

5.17 The change in the structure of operating revenues and expenses over the past decade is illustrated in Table 5-5. The share of the various components of the operating revenues did not change significantly. On the expense side, however, there 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. The share of indirect expenses has decreased due mainly to the decline in the share of ticketing, sales and promotion expenses, with a corresponding increase in the share of direct aircraft expenses which resulted from the increases in flight operations expenses.

Table 5-4. Operating and net results[1] — World (1993 – 2002)
(scheduled airlines of ICAO Contracting States[2])

			Operating result		Net result[3]			
Year	Operating revenues U.S.$ (millions)	Operating expenses U.S.$ (millions)	Amount U.S.$ (millions)	Percentage of operating revenues	Amount U.S.$ (millions)	Percentage of operating revenues	Direct subsidies U.S.$ (millions)	Income taxes U.S.$ (millions)
1993	226 000	223 700	2300	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	100	–2 170
1996	282 500	270 200	12 300	4.4	5 300	1.9	30	–2 500
1997	291 000	274 700	16 300	5.6	8 550	2.9	180	–4 200
1998	295 500	279 600	15 900	5.4	8 200	2.8	10	–4 800
1999	305 500	293 200	12 300	4.0	8 500	2.8	10	–4 300
2000	328 500	317 800	10 700	3.3	3 700	1.1	10	–2 750
2001	307 500	319 300	–11 800	–3.8	–13 000	–4.2	10	3 610
2002[4]	312 500	319 800	–7 300	–2.3				

1. Revenues and expenses are estimated for non-reporting airlines.
2. Up to and including 1997 operations within the Commonwealth of Independent States are excluded.
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 the estimates of large figures (revenues and expenses) and are therefore susceptible to substantial uncertainties.
4. Preliminary data — net results are not yet available.

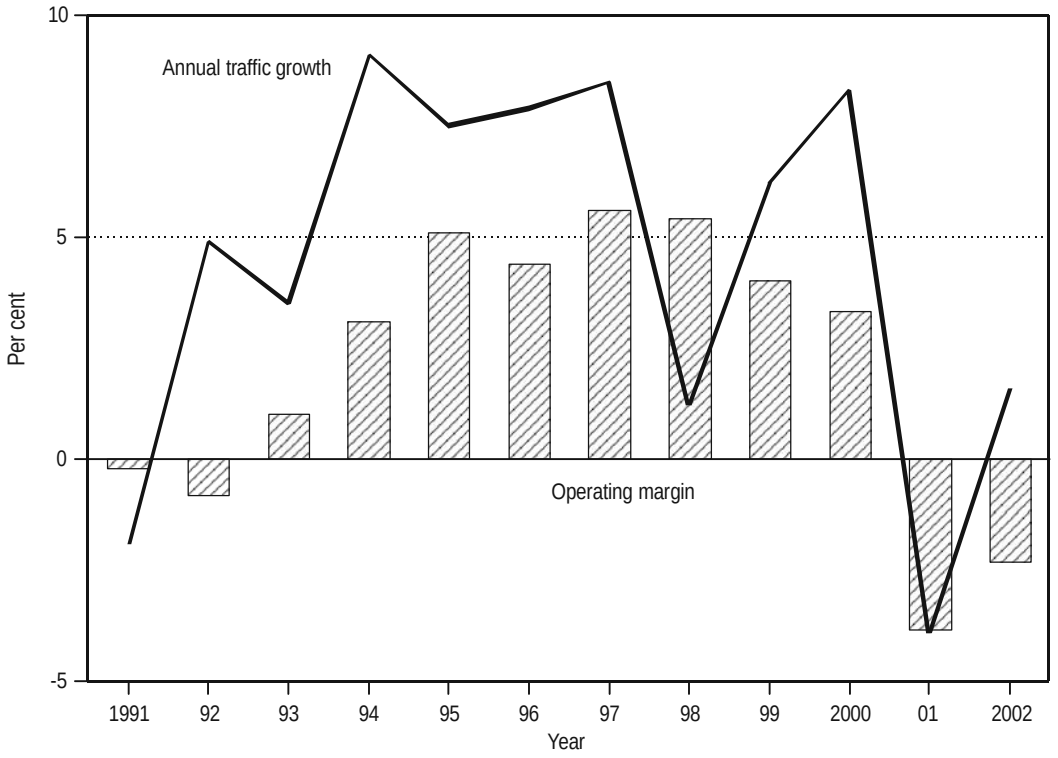
Source: ICAO Air Transport Reporting Form EF.

Table 5-5. Distribution of operating revenues and expenses — World (1991 and 2001) (scheduled airlines of ICAO Contracting States[1])

Description	Distribution by item (per cent) 1991	2001	Change in per cent share of item 1991 to 2001
OPERATING REVENUES			
Scheduled services (total)	86.9	87.0	0.1
Passenger	76.3	75.6	–0.7
Freight	9.5	10.7	1.2
Mail	1.1	0.6	–0.5
Non-scheduled operations	4.0	3.4	–0.6
Incidental	9.1	9.6	0.5
TOTAL	100.0	100.0	—
OPERATING EXPENSES			
Direct aircraft			
Flight operations (total)	27.4	30.4	3.0
Flight crew	7.4	7.1	–0.3
Fuel and oil	13.2	13.4	0.2
Other	6.8	8.2	1.4
Maintenance	11.2	11.3	–0.1
Depreciation and amortization	7.0	7.1	0.1
Sub-total	45.6	48.8	3.2
Indirect			
User charges and station expenses (total)	16.7	16.9	0.2
Landing and associated airport charges	4.0	4.0	0.0
En-route facility charges	2.0	2.5	0.5
Station expenses	10.8	10.4	–0.4
Passenger services	10.4	10.2	–0.2
Ticketing, sales, promotion	16.7	11.2	–5.5
General, administrative and other operating expenses	10.6	12.9	2.3
Sub-total	54.4	51.2	–3.2
TOTAL	100.0	100.0	—

1. Excludes operations within the CIS.
Source: ICAO Air Transport Reporting Form EF.

5.18 The variations in the annual operating result, measured as a percentage of airline revenue, are illustrated graphically for the period 1991-2002 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. Traffic rebounded in 1992 after a decline in 1991, while the operating result remained in deficit. 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. Financial performance improved further in 1997 and 1998 due to increases in average passenger load factors in 1997 and declines in fuel prices in both years. In 1999 the financial performance was less buoyant than in preceding years and in 2000 it deteriorated further, mainly due to substantial increases in fuel prices. The unprecedented traffic decline in 2001, combined with high fuel prices in the early part of the year and increasing security and insurance costs in the latter part led to a significant deterioration in airline financial performance. In 2002, the first complete year of falling demand and increased security and insurance costs for airlines following the events of 11 September 2001, airline financial performance remained depressed.

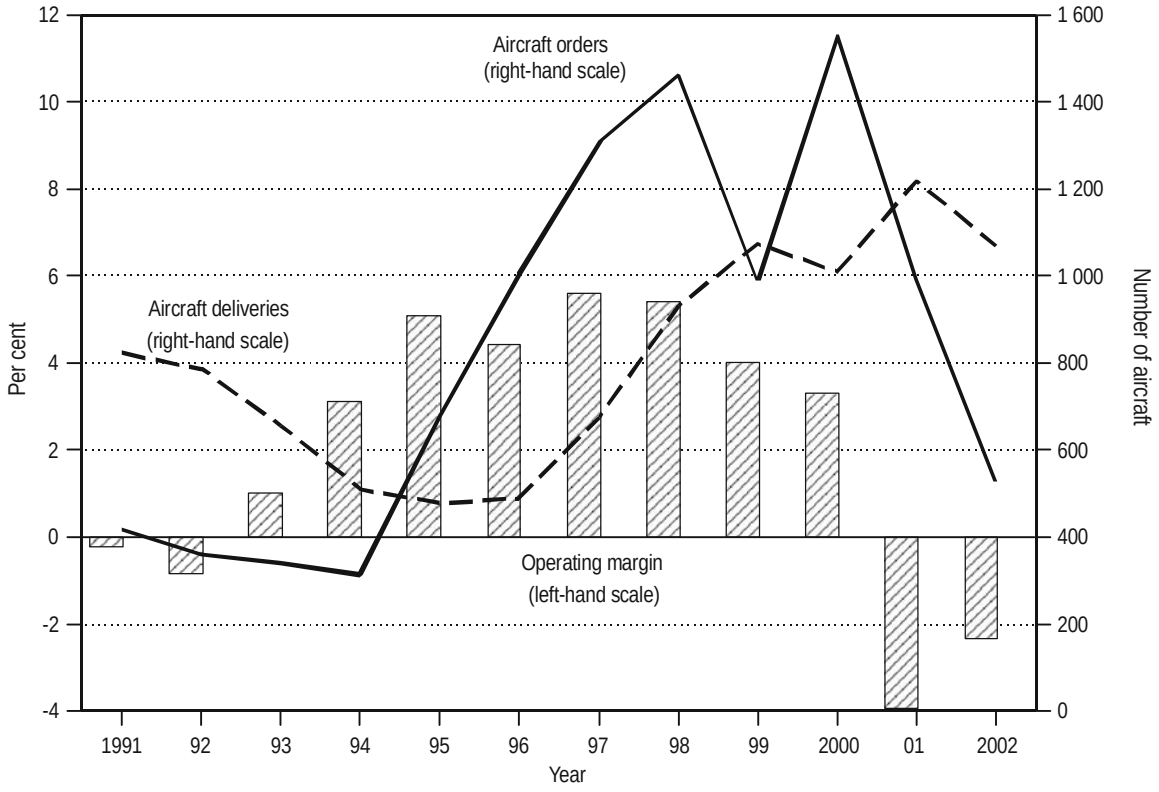


Source: ICAO Air Transport Reporting Forms A and EF.

Figure 5-5. Financial return and traffic growth of the scheduled airline industry — World (1991–2002)

5.19 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.

5.20 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 financing. 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. Aircraft orders started to increase again from 1996, surpassing aircraft deliveries for the first time since 1990. In 1999, orders dropped almost to



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

Figure 5-6. Financial return and aircraft supply — World (1991–2002)

the level of deliveries, to rebound significantly in 2000 but again to drop below the level of deliveries in 2001 and 2002, primarily due to airlines deferring their deliveries as a result of the traffic decline, as illustrated in Figure 5-6.

AIRLINE TRAFFIC FORECASTS

5.21 As a basis for the passenger traffic forecasts for this Circular, econometric analyses were carried out to determine the historical relationship between airline passenger traffic, economic cycles and airline yield levels. Previously used and additional econometric models proved on this occasion to be less than satisfactory. This is because since 11 September 2001 traffic demand has been affected by factors that cannot be readily quantified and included in the models, such as passenger concerns about flying and the discomfort caused by heightened security measures at airports, commonly referred to as "fear and hassle" factors.

5.22 Annual projections of traffic demand for the years 2003, 2004 and 2005 on this occasion included somewhat subjective inputs based on expectation of future development of economic and demographic factors as well as anticipated changes in the "fear and hassle" factors. Due consideration was also given to the recorded activity in the first five months of 2003.

5.23 The reasonably positive economic outlook presented in Figure 5-1 and Table 5-1 augurs well for global traffic demand over the forecast period. The prospects for airline yields are closely related to cost developments and market conditions in the airline industry. Productivity in the airline industry was somewhat compromised following the sudden decline in traffic in 2001 and the time lag required for input adjustment; it is expected that productivity improvement will resume and continue to produce cost savings, but these savings will probably be used partly to offset the accumulated losses and their effect on air fares will therefore be limited. 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. In recent years, fuel price volatility has been short term, with limited impact on year-average price levels and airline yields. However, after soaring in 1999 and 2000, fuel prices declined in 2001 but started to increase again in 2002. Despite airline efforts at "hedging" fuel prices, airline fuel expenses are expected to stay volatile during the forecast period. Salaries and wages represent the largest airline expense item. Labour costs have declined somewhat since 2001 mainly due to personnel reductions and labour concessions, but it is expected that cost pressures may increase over the next few years. 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. It is assumed that the effects of the "fear and hassle" factors will vanish progressively.

5.24 The global and regional scheduled passenger traffic forecasts for 2003, 2004 and 2005, based on economic assumptions and other considerations, are presented in Table 5-6. Global passenger traffic in terms of passenger-kilometres performed is expected to remain

Table 5-6. ICAO scheduled passenger traffic forecasts — World and regions (2003-2005) (passenger-kilometres performed)

	ACTUAL				ESTIMATED		FORECAST					
Region of airline registration	1991 (billions)	2000 (billions)	2001 (billions)	Average Annual Growth 1991-2001 (%)	2002 (billions)	Growth (%)	2003 (billions)	Growth (%)	2004 (billions)	Growth (%)	2005 (billions)	Growth (%)
Africa	39.2	66.4	66.9	5.5	66.2	–1.0	67.9	2.5	71.5	5.3	76.2	6.7
Asia/Pacific	359.3	735.5	744.1	7.6	785.1	5.5	778.8	-0.8	817.0	4.9	872.5	6.8
Europe	551.9	804.1	778.3	3.5	769.7	–1.1	770.5	0.1	802.1	4.1	851.8	6.2
Middle East	45.4	93.8	96.9	7.9	106.7	10.1	109.5	2.6	115.8	5.8	124.2	7.2
North America	759.8	1 175.7	1 109.3	3.9	1 082.3	–2.4	1 082.3	0.0	1 124.5	3.9	1 189.7	5.8
Latin America/ Caribbean	87.7	141.8	134.3	4.4	132.3	–1.5	134.3	1.5	140.7	4.8	150.3	6.8
World	1 843.3	3 017.3	2 929.8	4.7	2 942.3	0.4	2 943.2	0.0	3 071.6	4.4	3 264.8	6.3

unchanged in 2003, rebound in 2004 at 4.4 per cent and grow at 6.3 per cent in 2005. These forecasts are illustrated in Figure 5-7, together with the annual growth pattern over the past ten years.

5.25 Traffic growth will vary by geographic region because of the impact of specific local or regional factors. It is anticipated that the traffic of the airlines of the Asia/Pacific region will decline by 0.8 per cent in 2003 due to the effects of the outbreak of severe acute respiratory syndrome (SARS). However, the region is expected to progressively regain momentum and its position as the fastest growing market. The markets for the European and North American airlines are anticipated to stabilize in 2003 and to rebound somewhat in 2004 and 2005 as a result of the economic recovery and the dissipation of negative perception factors ("fear and hassle" factors). The airlines of Africa and the Middle East are expected to experience relatively strong rates of traffic growth throughout the forecast period. Traffic of the airlines of Latin America and the Caribbean is expected to grow moderately above the world average in each forecast year. Further details of the trends and forecasts on a region-by-region basis may be found in Chapter 6.

AIRLINE FINANCIAL FORECAST

5.26 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 U.S. dollar complicate the interpretation and forecasting of global financial results which are presented in U.S. dollar terms. Also, as 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.

5.27 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). Consequently, total revenues in current U.S. dollars are expected to increase moderately by about 0.5 per cent in 2003, rebound to grow by 5.4 per cent in 2004 (to exceed the level attained in 2000) and to grow further by 7.6 per cent in 2005. These rates compare with an average rate of 3.7 per cent per annum experienced over the past ten years.

5.28 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. As a result of these considerations, airline expenses in current U.S. dollars are expected to increase

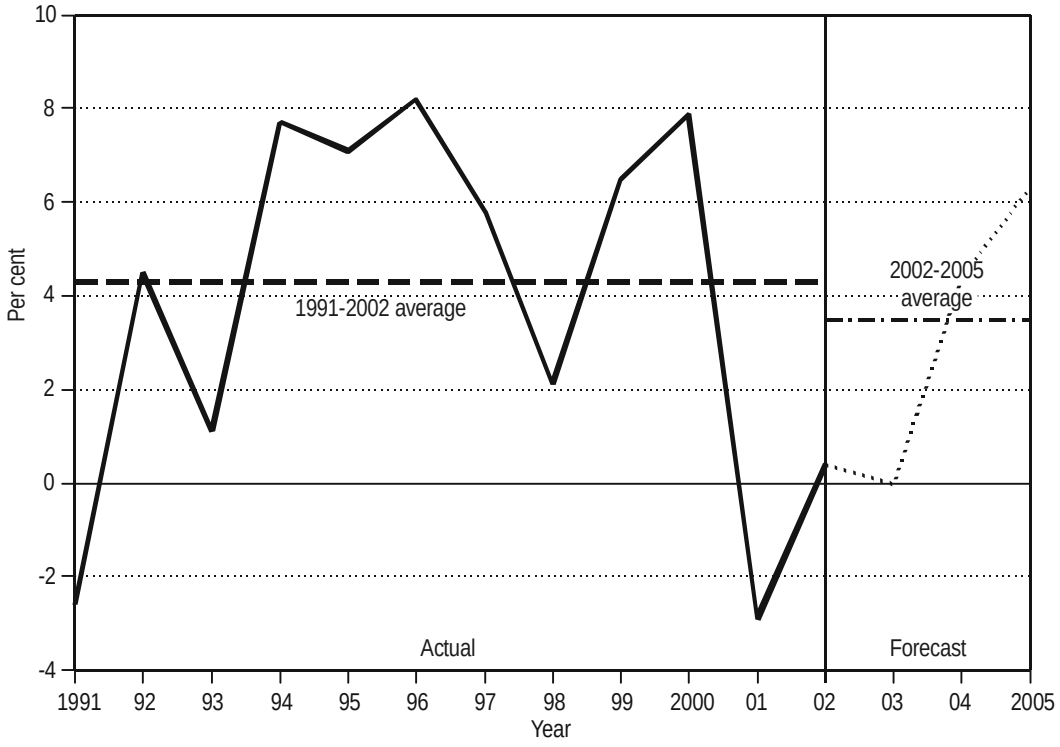


Figure 5-7. Scheduled passenger traffic growth — World (1991–2005) (passenger-kilometres performed)

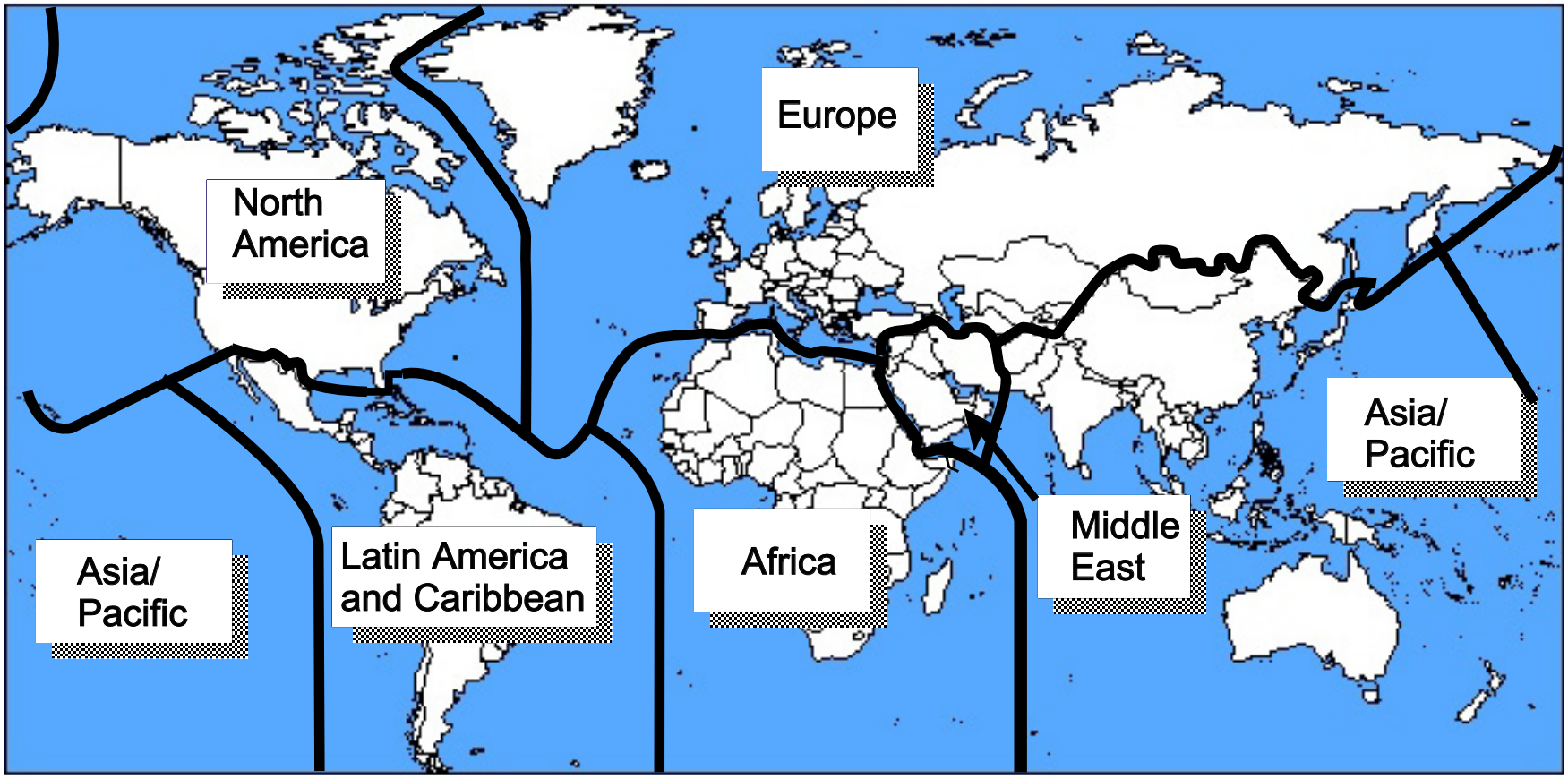
at the rate of about 0.3 per cent in 2003 and grow by 4.3 and 6.4 per cent in the years 2004 and 2005, respectively (compared to an average rate of 3.8 per cent per annum experienced over the past ten years).

5.29 The operating result for the world's scheduled airlines is the difference between operating revenues and expenses, the forecasts of which have been made independently; both are 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 continues to remain negative in 2003 at -2.1 per cent (compared to an estimated -2.3 per cent in 2002). This result improves progressively and breaks even by 2005. These estimates suggest a gradual improvement in the financial outlook for the global airline industry, during the forecast period, in line with expectations for traffic growth and general economic development, barring any unforseen events of significance.

PART III

REGIONAL PERSPECTIVES
2002 to 2005

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 2002, followed by trends in economic development, airline finances and scheduled passenger traffic, with forecasts of the latter through to 2005. The six ICAO statistical regions (see map) form the basis for the geographical division, presented as follows: Africa; Asia/Pacific; Europe; Middle East; North America; Latin America and the Caribbean.

AFRICA

Major civil aviation events and developments in 2002

6.2 In Western and Central African States, the voluntary liquidation of the debt-laden multinational airline "Air Afrique" was a critical event, resulting in the revision of bilateral air service agreements among some States. These developments paved the way for national airlines to strengthen their commercial activities and for start-ups by a growing number of small airlines.

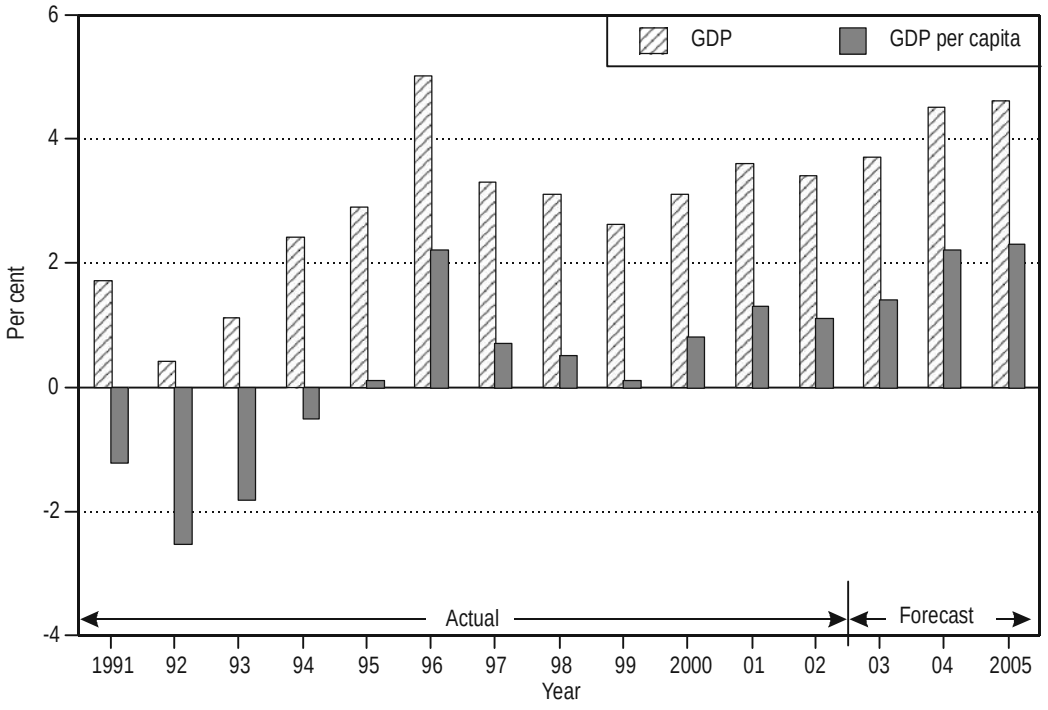
6.3 In implementing the Yamoussoukro Declaration, joint efforts between the Economic and Monetary Community of Central Africa and the Economic Community of West African States to liberalize air transport in the latter two sub-regions resulted in reviews of the current approach to economic regulation, including evaluation of a number of options and institutional arrangements. The Council of Ministers of the West Africa Economic and Monetary Union adopted a common air transport programme, made up of preliminary regulatory texts on air services agreements, a draft text on anti-competition law, and cooperation/collaboration with ICAO under the Cooperative Development of Operational Safety and Continuing Airworthiness Programme (COSCAP). In general, the political will for the creation of autonomous Civil Aviation Authorities continued; meanwhile the Agency for Air Navigation Safety in Africa and Madagascar continued to assist its member States in capacity building on behalf of Civil Aviation Authorities.

Economic trends

6.4 Over the 1991–2001 period, the aggregate African economy grew at an average annual rate of 2.7 per cent (GDP in real terms), although GDP per capita declined at a rate

of 0.1 per cent per annum over the decade. Figure 6-1 illustrates the year-to-year changes in the region's GDP and GDP per capita. Domestic factors ranging from a lower incidence of civil strife in some countries to greater macroeconomic stability and modest progress in liberalizing markets and privatizing state enterprises helped the region's improved economic performance significantly in the second part of the 1990s. Favourable external conditions also contributed, most notably the rapid growth in world trade, surging private capital flows and a mini-boom in commodity prices (1994–1995). However, the rate of growth decreased significantly later in that 10-year period, particularly in sub-Saharan Africa. This can be attributed to the resurgent incidence of civil conflict and to losses from terms of trade resulting from weak commodity prices and most recently from high oil prices.

6.5 The aggregate African economy is estimated to have grown at 3.4 per cent in 2002 compared to 3.6 per cent in 2001. Social unrest in certain Western and Central African States continued to affect the economic performance of that sub-region. Other factors to hamper macro-economic expansion of the problem-stricken countries themselves and their neighbours were lower oil production in Nigeria, ongoing social unrest in Zimbabwe and a sharp decline in agricultural output due to poor weather conditions in many Southern African countries and Western Sahel. Aided by continued political strengthening, the global recovery, and higher



Source: IMF, WEFA Group.

Figure 6-1. Annual change in real GDP and GDP per capita — Africa (1991–2005)

non-fuel commodity prices, economic growth in Africa is projected to rise by 3.7 per cent in 2003, 4.5 per cent in 2004 and 4.6 per cent in 2005. This trend will, however, depend on weather conditions and a marked amelioration in political stability in general and the security situation in West Africa in particular.

Airline financial trends

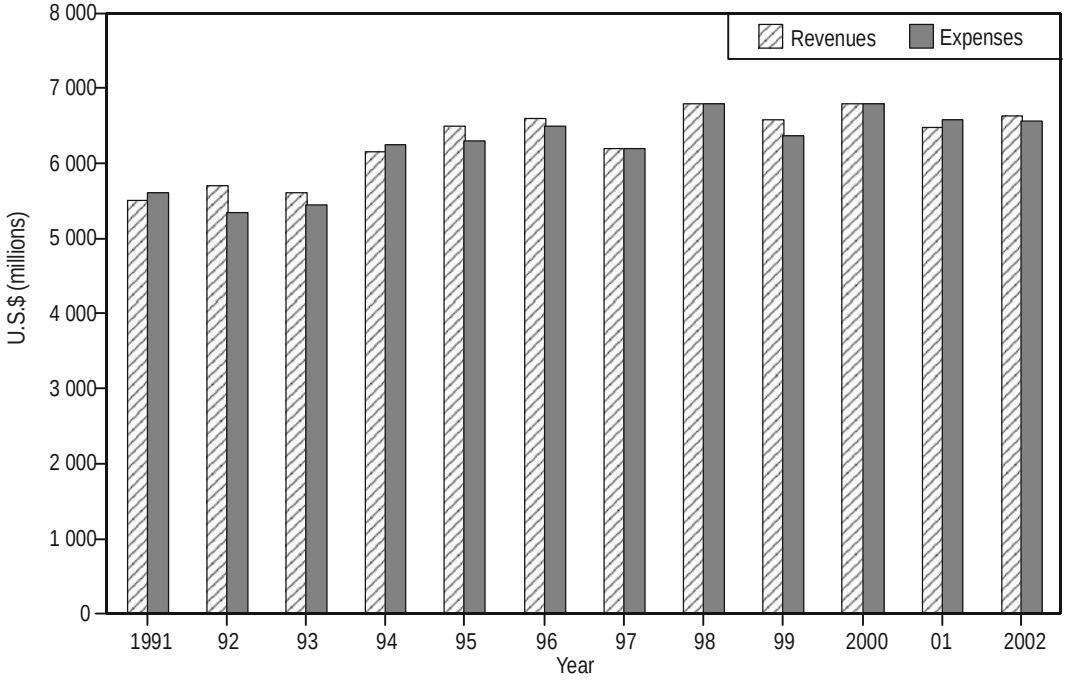
6.6 Over the 1991-2001 period, operating revenues (in dollars) of the scheduled airlines of the African region increased at an average annual rate of 1.7 per cent (compared to the world annual average increase of 4.1 per cent). Operating expenses for the same period also increased by 1.7 per cent per annum. These rates reflect the relatively low traffic growth experienced over most of the period, a steady decline in average yields and efforts by African airlines to improve efficiency and financial performance. Negative operating results were experienced in 1991, 1994 and 2001 as illustrated in Figure 6-2.

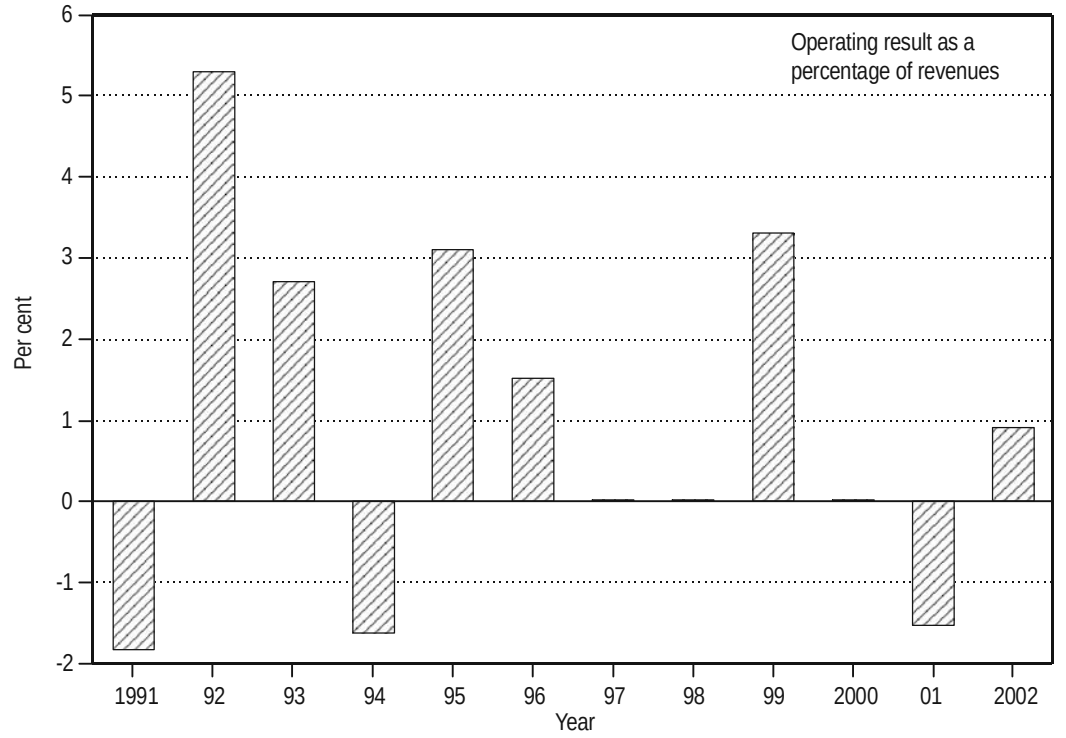
6.7 For the 1991-2001 period, average scheduled passenger yields for airlines of the region, measured in terms of cents per passenger-kilometres performed (PKPs), declined at an average annual rate of 6.9 per cent in real terms (compared to a 4.4 per cent decline for the world). The year-to-year comparisons of the changes in real passenger yield of African and world airlines for the years 1991-2002 are illustrated in Figure 6-3. Since 1991, average yields of the region's airlines have decreased more than the world average yields each year, except for 1998 and 2002.

Airline passenger traffic trends and forecast

6.8 Over the 1991-2001 period, scheduled passenger traffic (in PKPs) of the airlines of the African region increased at an average annual rate of 5.5 per cent (compared to the world annual average of 4.7 per cent). Traffic growth in recent years has been significantly affected by the slowdown in the world economy and the subsequent global crisis in the airline industry. After achieving high growth rates in 1996 and 1997, traffic declined by 1 per cent in 1998 (compared to world average growth of 2.1 per cent), rebounded in 1999 to grow by 11 per cent, and continued to grow in 2000 at a 6.5 per cent rate; however, in 2001 traffic growth dropped to 0.7 per cent and, in 2002, is estimated to have decreased by 1 per cent. Traffic performance details for airlines registered in the region are given in Table 6-1. The year-to-year traffic growth comparison between world and African airlines is shown in Figure 6-4.

6.9 As shown in Table 5-6 and illustrated in Figure 6-4, scheduled passenger traffic of the airlines of the African region is expected to grow by 2.5, 5.3 and 6.7 per cent for the years 2003, 2004 and 2005, respectively.

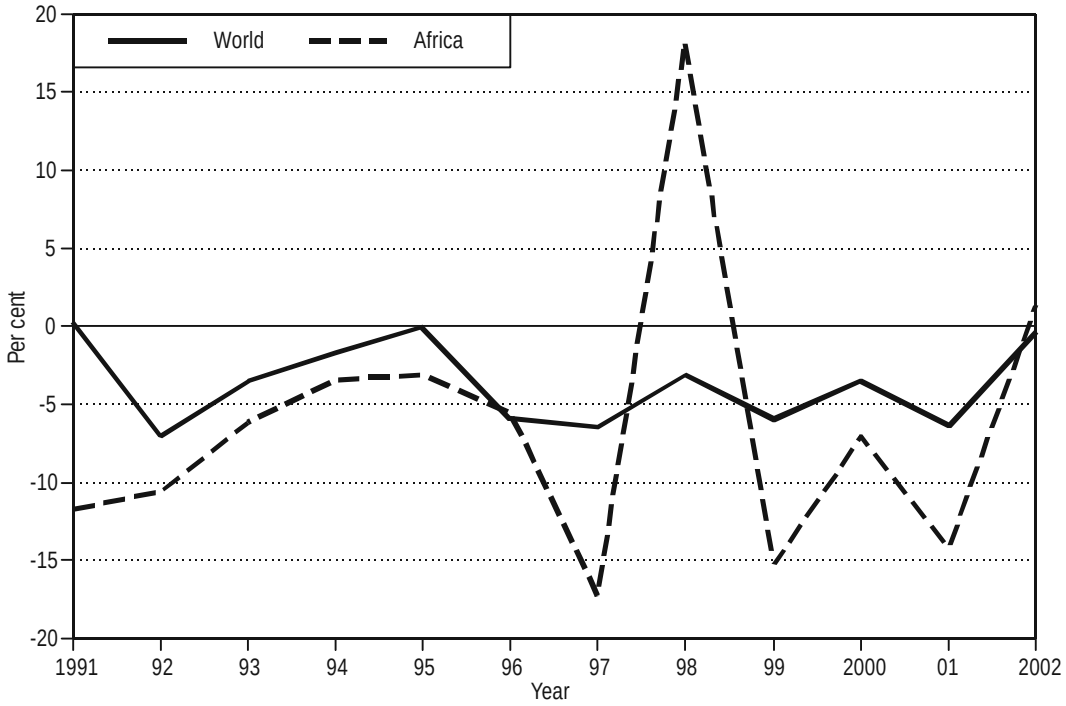




Note.— 2002 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF.

Figure 6-2. Scheduled airline operating revenues and expenses — Africa (1991–2002)



Notes.— 2002 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

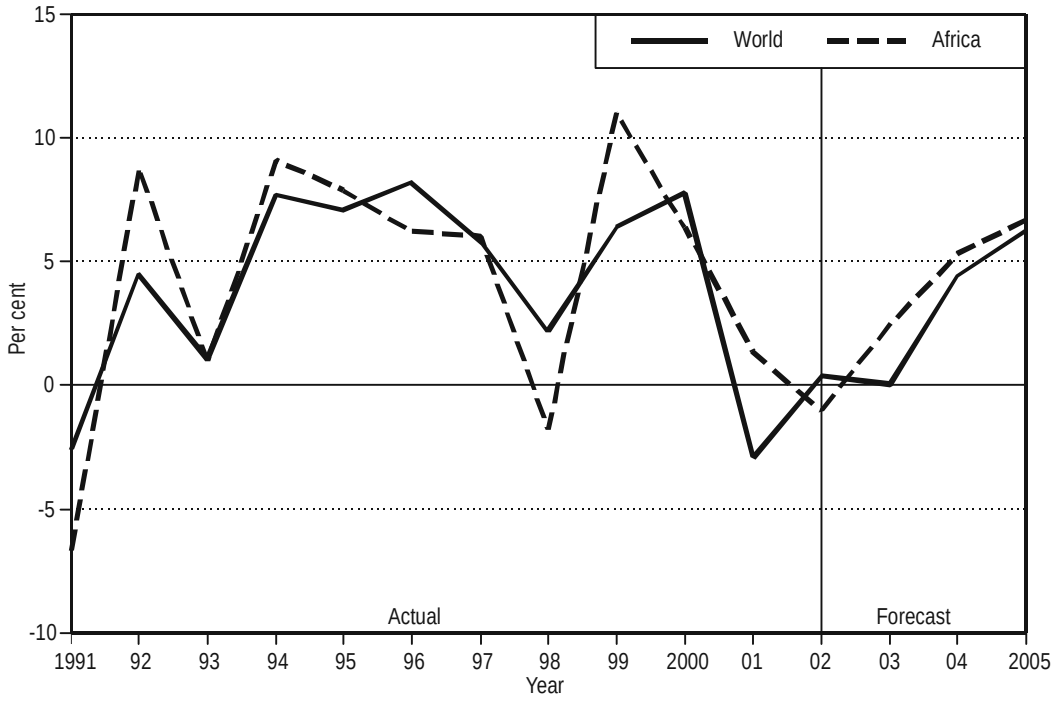
Source: ICAO Air Transport Reporting Forms A and EF.

Figure 6-3. Annual change in real scheduled passenger yield — Africa and World (1991–2002)

Table 6-1. Scheduled traffic — Airlines of Africa (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	17 540	–2.5	3.2	29 920	–3.2	1.9
Passenger-kilometres performed (millions)	57 480	–1.2	3.3	66 220	–1.0	2.3
Freight and mail tonne-km performed (millions)	1 800	–10.4	1.7	1 900	–9.7	1.6

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-4. Scheduled passenger traffic growth (PKPs) — Africa and World (1991–2005)

ASIA/PACIFIC

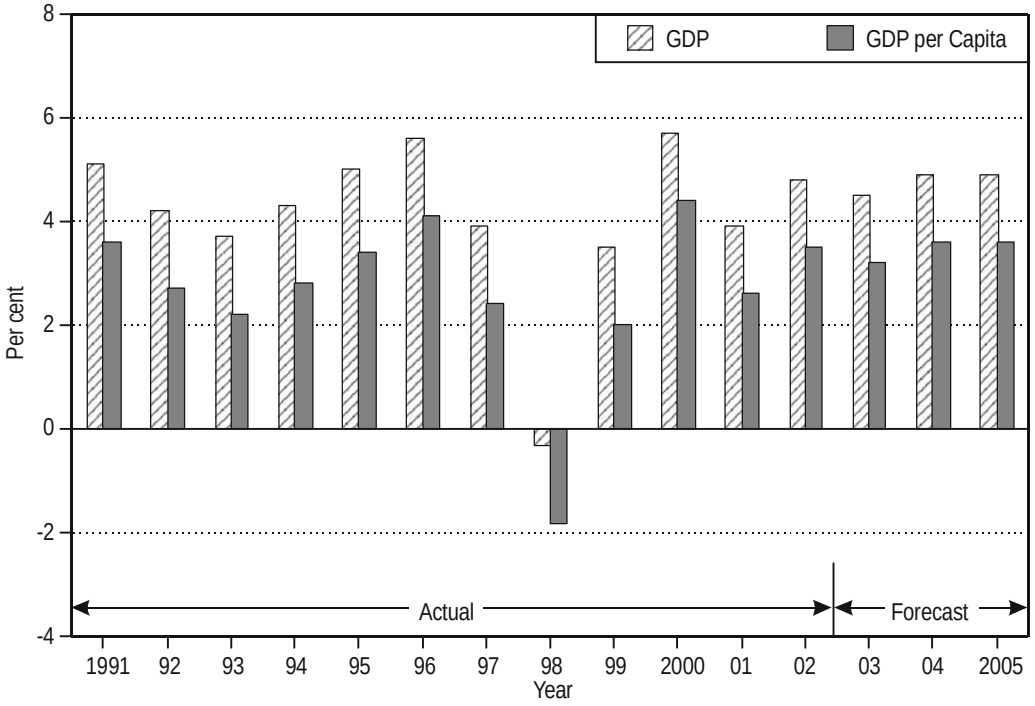
Major civil aviation events and developments in 2002

6.10 Typically the plurilateral arrangements to liberalize air transport services prepared or adopted in 2002 on a regional/sub-regional basis or among a group of like-minded States in the Asia/Pacific region seek to improve market access and services for participating States. The Multilateral Agreement on the Liberalization of International Air Transportation, known as the "Kona" Agreement, signed in 2001 by five Members of the Asia Pacific Economic Cooperation Forum (APEC), was joined by two other Pacific Rim States (Peru and Samoa) during 2002. As a first step in the full liberalization of air freight services, 10 States of the Association of Southeast Asian Nations (ASEAN) signed the ASEAN Memorandum of Understanding on Air Freight Services, which allows the designated airlines of participating States to operate all-cargo services of up to 100 tonnes weekly with no limitations on frequency and aircraft type. The Pacific Islands Air Services Agreement, which would progressively create a single aviation market in the sub-region after formal endorsement by the 14 Member States of the Pacific Islands Forum, remains in the pipeline. Based on their 1998 agreement, the CLMV States (Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam) developed a draft sub-regional Multilateral Agreement on Air Transport for adoption in 2003.

Economic trends

6.11 Over the 1991–2001 period, the Asia/Pacific economy grew at an average annual GDP rate of 3.9 per cent in real terms, and GDP per capita increased at 2.5 per cent per annum. Asia/Pacific has achieved the largest share in the world economy and has also been the fastest growing region over more than a decade (despite a slowdown and recession when GDP growth dropped from 5.6 per cent in 1996 to 3.9 per cent in 1997 and further to –0.3 per cent in 1998). The region regained its economic strength when GDP growth resumed at 3.5 per cent in 1999, continued at a 5.7 per cent rate in 2000, and 3.9 per cent in 2001 despite a global slowdown that year. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-5.

6.12 In 2002, recovering export demand including that of intra-regional trading partners and the stimulus provided by stronger domestic consumer demand helped to revive economic strength in Asia and the Pacific; the region's GDP grew at 4.8 per cent, not only above the world average but also the highest growth rate among all ICAO regions. The developing economies in Asia/Pacific contributed significantly as their aggregate GDP grew by 6.5 per cent, but this result masks vast differences among countries. China's GDP growth of 8 per cent continued to reflect a strong economic performance which was to a varying extent also experienced by several South-East Asian economies. Asia's four newly industrialized economies recovered significantly, averaging 4.6 per cent GDP growth, following their sharp slowdown to 0.8 per cent growth in 2001. Japan's GDP grew for the second consecutive year at a very low level (0.3 per cent), while the economies of both Australia and New Zealand expanded their growth momentum to around 4 per cent.



Source: IMF, WEFA Group.

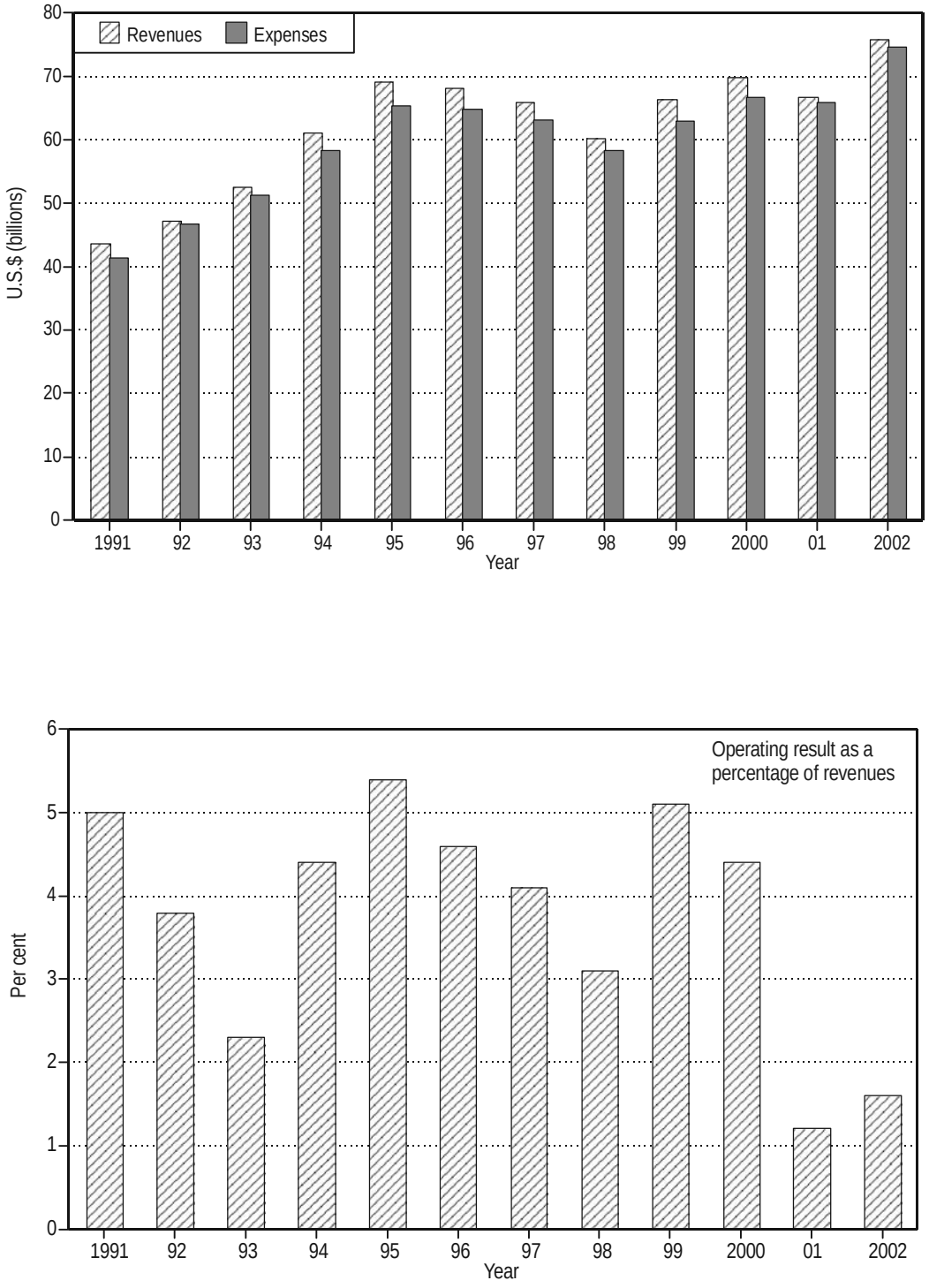
Figure 6-5. Annual change in real GDP and GDP per capita — Asia/Pacific (1991–2005)

6.13 The aggregate Asia/Pacific GDP is projected to grow in real terms at 4.5 per cent in 2003 and at 4.9 per cent in both 2004 and 2005. In spite of the optimism about economic growth in the Asia and Pacific region, any weakening in economies of major trading partners, such as the United States and Japan, rising fuel prices or conflict and social unrest could jeopardize the expected recovery of the region's economy.

Airline financial trends

6.14 Over the 1991-2001 period, operating revenues of the scheduled airlines of the Asia/Pacific region increased at an average annual rate of 4.3 per cent (compared to the world average annual growth rate of 4.1 per cent). Operating expenses for the same period increased by 4.8 per cent per annum. Airlines in the region enjoyed positive operating results throughout the last decade as illustrated in Figure 6-6. In 2001, airlines of the Asia/Pacific region stood out by achieving an aggregate operating profit of around $800 million. For 2002, the operating profit is estimated at around $1.2 billion.

6.15 Average scheduled passenger yields for airlines of the region, measured in terms of cents per PKP, have fluctuated significantly since 1991 and resulted in an annualized decline



Note.— 2002 figures are from estimated data.

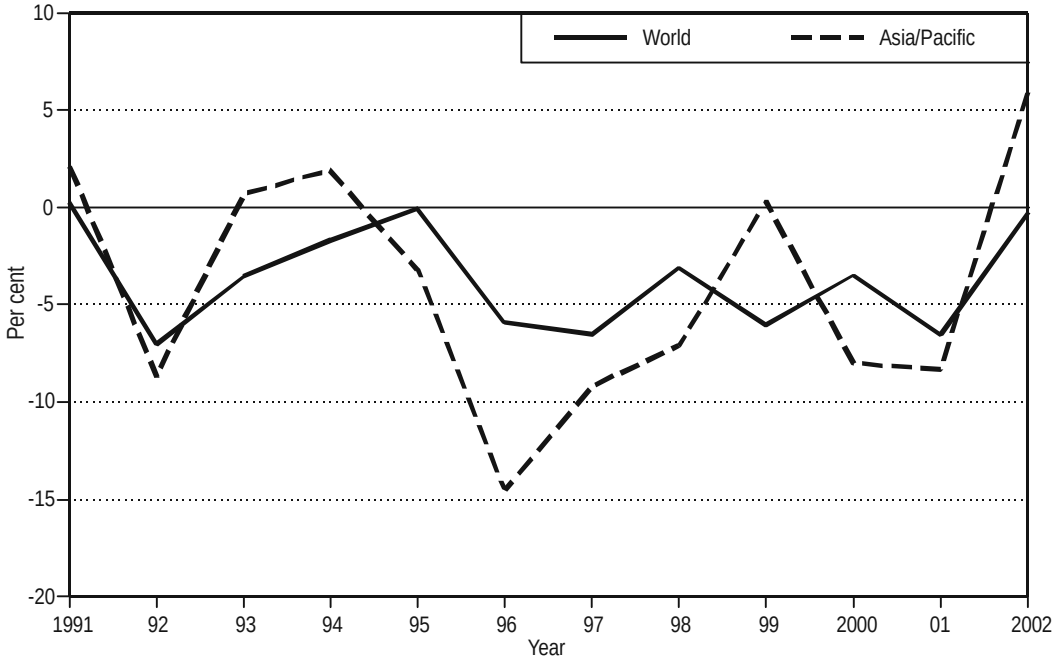
Source: ICAO Air Transport Reporting Form EF.

Figure 6-6. Scheduled airline operating revenues and expenses — Asia/Pacific (1991–2002)

of 5.7 per cent in real terms during the 1991-2001 period. Figure 6-7 compares the annual changes in real yield for the Asia/Pacific scheduled airlines with those for the world's airlines in total. The sharp fluctuations in airline yield reflect, in part, the fluctuation of the Japanese yen and other Asian currencies against the U.S. dollar.

Airline passenger traffic trends and forecast

6.16 Over the 1991-2001 period, scheduled passenger traffic (in PKPs) of airlines of the Asia/Pacific region increased at the average annual rate of 7.6 per cent, significantly higher than the world's annual average of 4.7 per cent. Having exhibited the highest growth rates among all ICAO regions for almost a decade, in 1998 the airlines of the region experienced a decline in traffic of 2.8 per cent, dampening world traffic growth which averaged a low 2.1 per cent. As a result of the speedy economic recovery in the Asian economies affected by the 1997/1998 recession, traffic increased by 7 and 10 per cent in 1999 and 2000, respectively, but



Notes.— 2002 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 and EF.

Figure 6-7. Annual change in real scheduled passenger yield — Asia/Pacific and World (1991–2002)

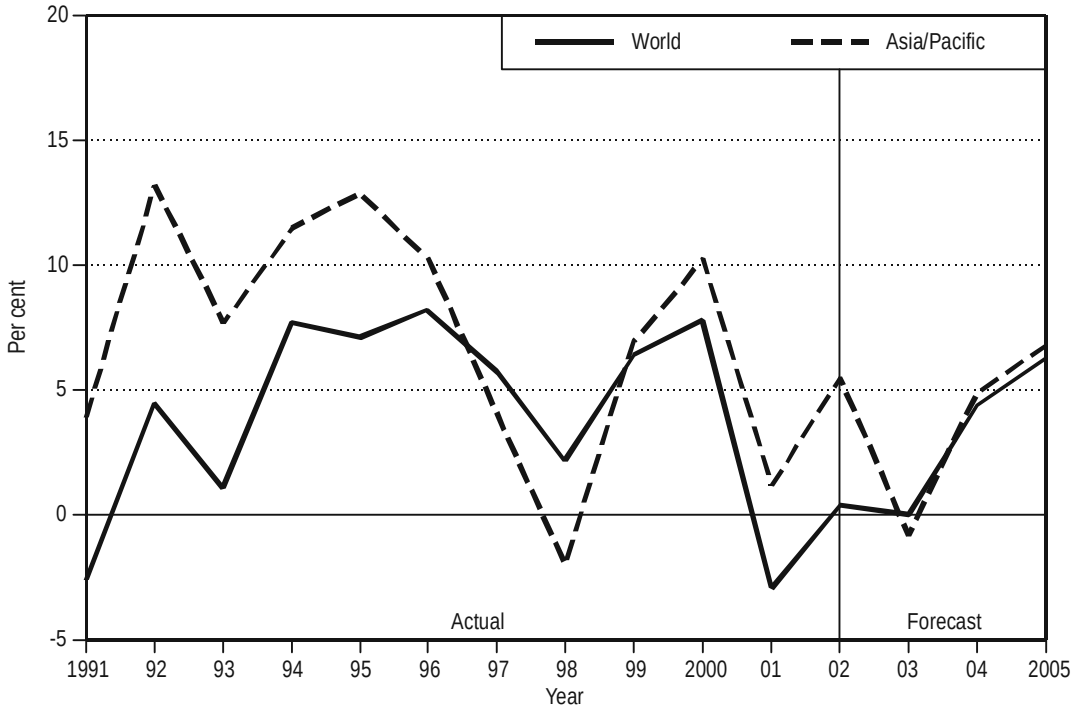
dropped to 1.2 per cent in 2001. In 2002, traffic growth regained momentum and is estimated at 5.5 per cent. Traffic performance details for airlines registered in the region are given in Table 6-2. The year-to-year traffic growth comparison between world and Asia/Pacific airlines is shown in Figure 6-8.

6.17 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 decline by 0.8 per cent in 2003 due to the effects on travel of SARS, and to recover at the rates of 4.9 and 6.8 per cent for the years 2004 and 2005, respectively, compared to world airline traffic growth of 0, 4.4 and 6.3 per cent over the same period.

Table 6-2. Scheduled traffic — Airlines of Asia/Pacific (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	131 370	7.3	24.1	400 320	4.4	24.8
Passenger-kilometres performed (millions)	537 620	4.9	31.0	785 110	5.5	26.7
Freight and mail tonne-km performed (millions)	39 080	10.6	37.8	43 280	10.5	35.7

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-8. Scheduled passenger traffic growth (PKPs) — Asia/Pacific and World (1991–2005)

EUROPE

Major civil aviation events and developments in 2002

6.18 The European Civil Aviation Conference (ECAC) forged a partnership with airlines, airports, consumer groups and the European Commission to improve airline passenger service and customer care as set out in the framework of the Voluntary Airline and Airport Passenger Service Commitments, the implementation of which was marked by the Parliamentary Assembly of the Council of Europe in Strasbourg in February.

6.19 The Collaborative Forum of Stakeholders, a forum of air navigation services providers, airports, aircraft operators and regulators, established the following 2002 targets for its high-level Task Force (under the auspices of the Air Transport Action Group) on research and exploration of sustainable solutions to overcome capacity shortages in Europe: a draft European action plan for airports (in cooperation with the Airports Council International-Europe); draft land-use planning and management regulations; contact groups at some 50 major airports; and promotion of the adoption of a single European air traffic controllers license.

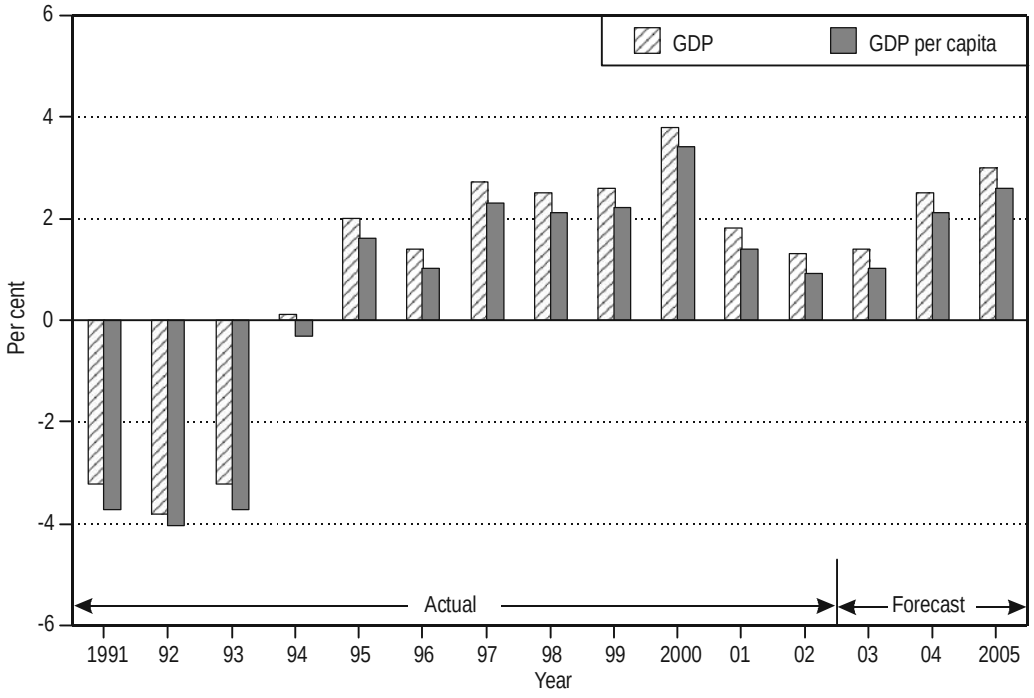
Economic trends

6.20 Following continuous economic growth throughout the 1980s, the aggregate European GDP went into decline starting in 1990, the primary reason being the serious contractions of economies of Eastern Europe and the Commonwealth of Independent States (CIS). By 1997, total output was back to where it had been in 1989, but masked a persistent divergence between countries in Western and Eastern Europe. Over the 1991–2001 period, the economies in the entire region (including the CIS), grew at an average annual rate of 1 per cent, measured in real-term GDP, with a growth rate of about 0.6 per cent for the aggregate GDP per capita. Figure 6-9 illustrates the annual changes in European GDP and GDP per capita.

6.21 The European region achieved average GDP growth of 1.3 per cent in 2002, to which the European Community (EC) contributed at a rate of 0.8 per cent. Economies of Central and Eastern European countries grew in the aggregate at around 2.9 per cent while those of the CIS grew stronger, averaging 4.8 per cent growth in GDP, yet at a slower pace than in the previous two years. The aggregate European economy is expected to grow at 1.4 per cent in 2003, and to improve slightly for 2004 and 2005 with a GDP growth of 2.5 per cent and 3 per cent, respectively.

Airline financial trends

6.22 Over the 1991-2001 period, operating revenues of the scheduled airlines of the European region (excluding operations within the CIS) increased at an average annual rate of 4 per cent (compared to the world annual average rate of 4.1 per cent). Operating expenses

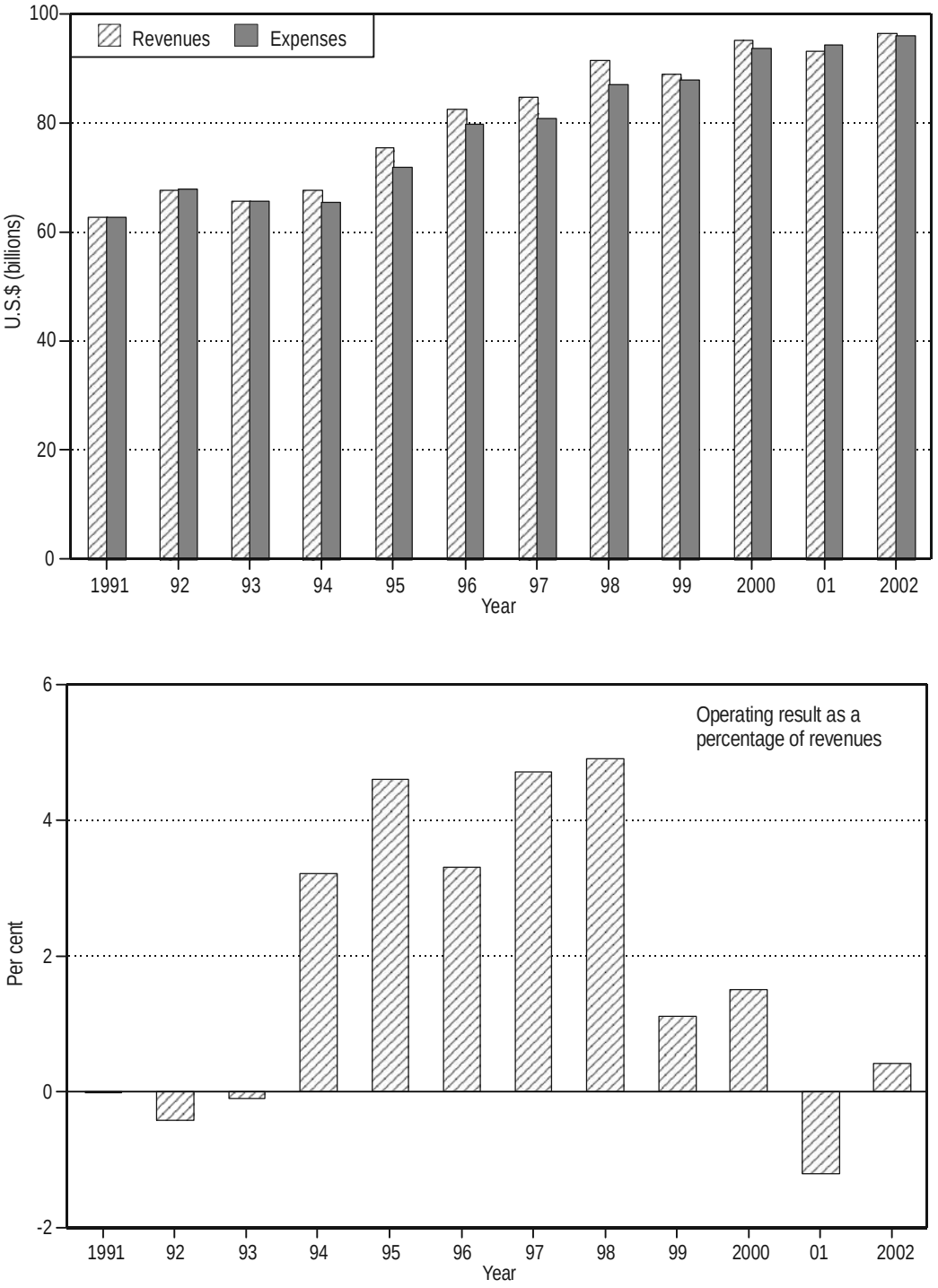


Source: IMF, WEFA Group.

Figure 6-9. Annual change in real GDP and GDP per capita — Europe (1991–2005)

for the same period increased by 4.2 per cent per annum. As illustrated in Figure 6-10, positive operating results were achieved during the period except for the years 1992, 1993 and 2001. After 1994, profitability in the European airline industry improved progressively. However, it started to decline in 1999 and an operating loss of around $1.1 billion was shown in 2001. In 2002, the operating result turned positive and is estimated at $400 million.

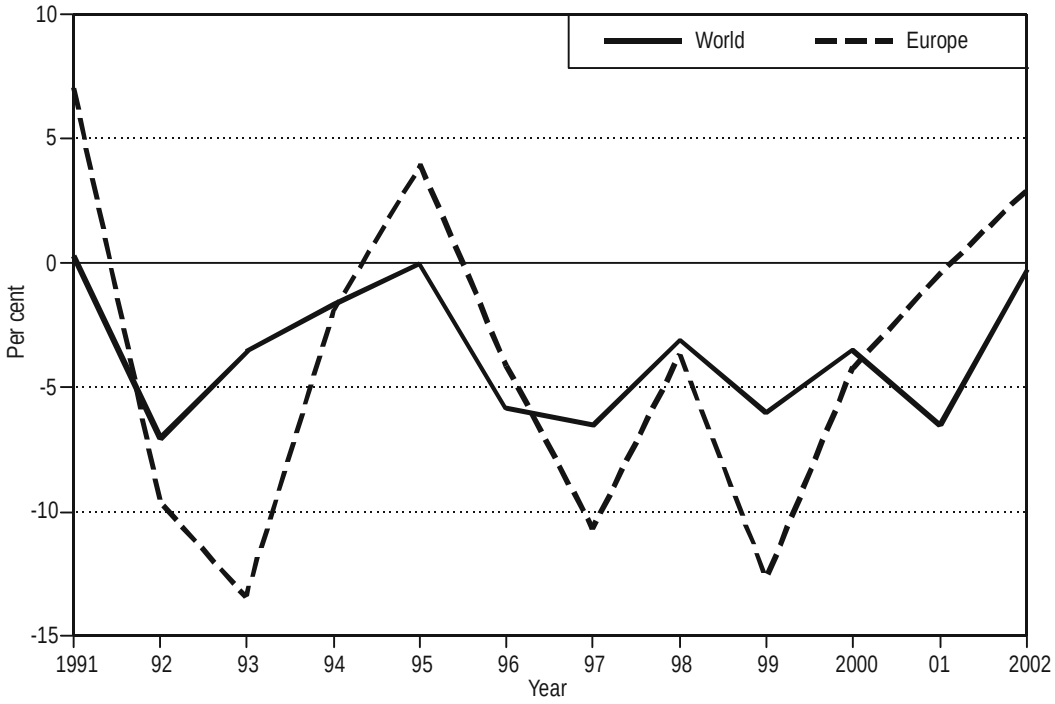
6.23 Annual changes in average scheduled passenger yields for airlines of the region (excluding operations within the CIS) reveal marked fluctuations over the last decade, as shown in Figure 6-11. Over the whole period 1991-2001, the annualized average showed a 5.8 per cent decline in yield, higher than the world result of a 4.4 per cent decline. By 1995, real yields had recovered from the sharp declines in 1992 and 1993 when the presence of excess capacity had heightened competitive pressures in airline markets. Stimulated by liberalization, competition remained on the rise and yield came under pressure again after 1996; that decline in yield was also in part due to the appreciation of the U.S. dollar against most European currencies (with the exception of the UK pound). In 1998, real yield increased slightly, accompanied by moderate passenger traffic growth in part due to the appreciation of some European currencies against the U.S. dollar. The years 1999 and 2000 witnessed a further decline in yields expressed in real terms due to the depreciation of European



Note.— 2002 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF.

Figure 6-10. Scheduled airline operating revenues and expenses — Europe (1991–2002)



Notes.— 2002 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 and EF.

Figure 6-11. Annual change in real scheduled passenger yield — Europe and World (1991–2002)

currencies against the U.S. dollar and a drop in yields in current terms triggered by competitive pressures in air transport markets served by European airlines. In 2001 and 2002, real yields improved sequentially when drastic capacity reductions led to relative gains in the pricing power of the airlines.

Airline passenger traffic trends and forecast

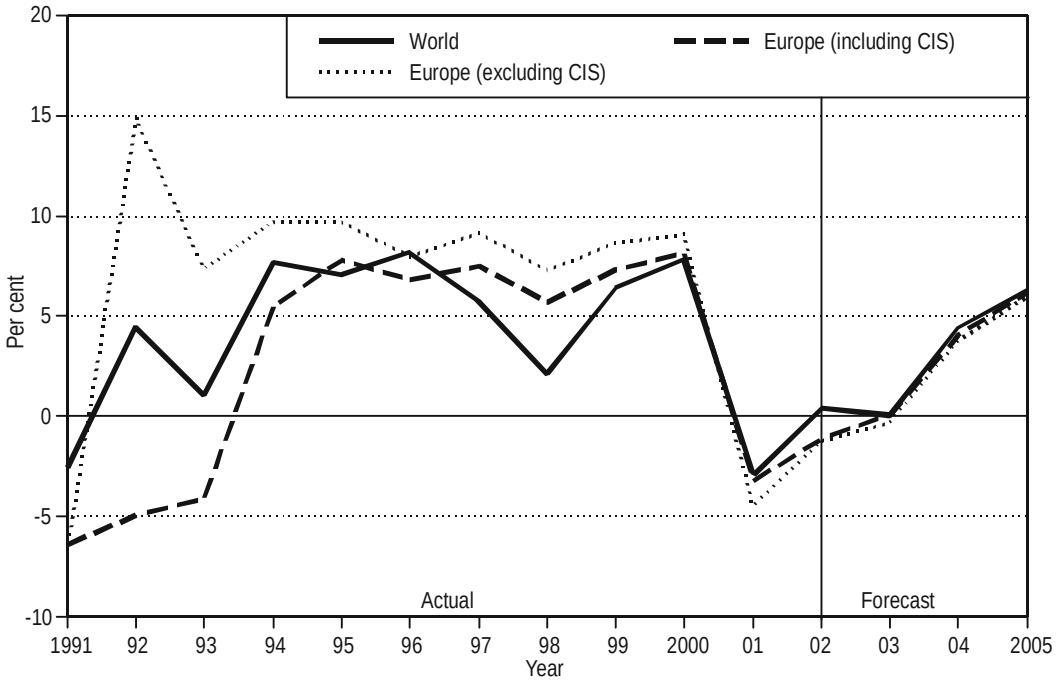
6.24 Over the 1991-2001 period, scheduled passenger traffic (in PKPs) of the airlines of the European region increased at an average annual rate of 3.5 per cent (compared to the world annual average of 4.7 per cent) despite a generally impressive performance in Western Europe (except in 1991). Excluding airlines of the CIS, European traffic grew at 8.2 per cent per annum over the period. Reported CIS traffic volumes dropped dramatically, on average by 12.2 per cent each year over the last decade, with PKPs in 2001 at only about 27 per cent of those in 1991. In 2001, the CIS total passenger traffic volume enjoyed (for the first time in the decade) a positive growth of 14.2 per cent, but this growth is estimated to have reversed in 2002 with a decline of 0.5 per cent. Traffic performance details for airlines registered in the region are given in Table 6-3. The year-to-year comparison of passenger traffic growth of airlines in Europe (including and excluding the CIS) and the world is shown in Figure 6-12.

6.25 As shown in Table 5-6 and illustrated in Figure 6-12, scheduled passenger traffic for the region as a whole is expected to grow marginally by 0.1 per cent in 2003 and to speed up to rates of 4.1 and 6.2 per cent in the years 2004 and 2005, respectively (compared to world airline growth of 0, 4.4 and 6.3 per cent). The airlines of Western Europe are expected to follow this pattern over the forecast period, except for a slight decline in traffic in 2003, as also illustrated in Figure 6-12, while traffic volumes for the CIS airlines are expected to grow steadily.

Table 6-3. Scheduled traffic — Airlines of Europe (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	263 720	1.5	48.4	422 620	–0.2	26.2
Passenger-kilometres performed (millions)	643 840	–1.2	37.2	769 710	–1.1	26.2
Freight and mail tonne-km performed (millions)	32 900	0.9	31.9	33 860	1.1	27.9

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-12. Scheduled passenger traffic growth (PKPs) — Europe and World (1991–2005)

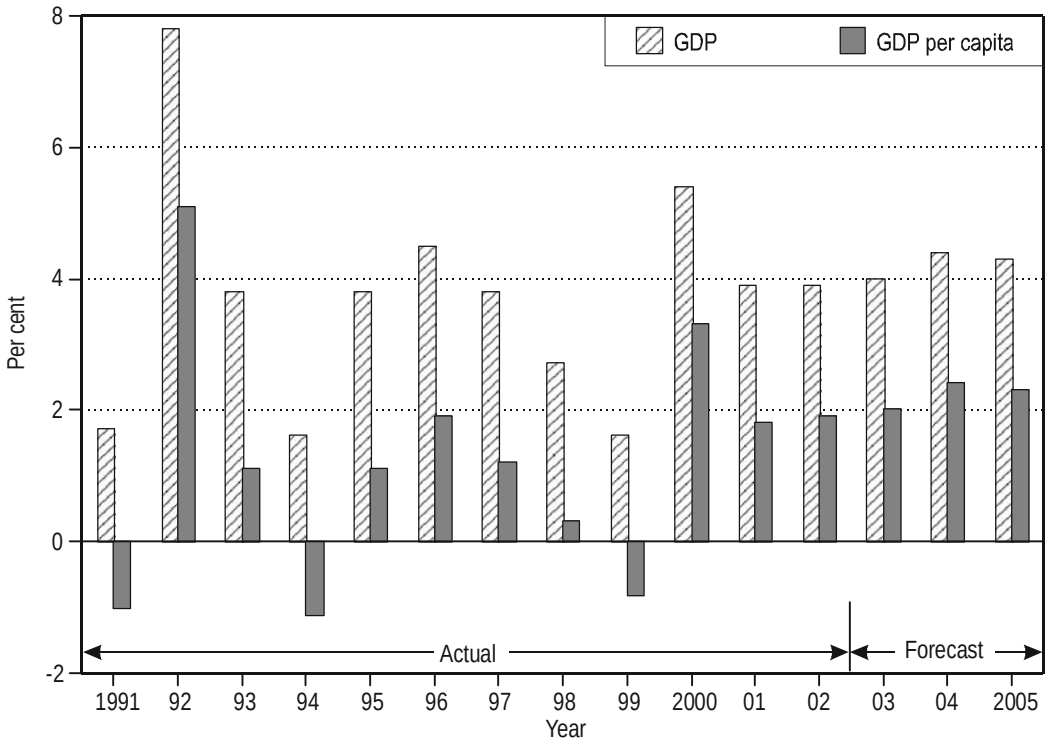
MIDDLE EAST

Major civil aviation events and developments in 2002

6.26 A multilateral agreement on the liberalization of traffic rights among Arab States to become effective by 2005 was approved in principle by the 6th General Assembly of the Arab Civil Aviation Commission (ACAC) (Rabat, Morocco, June 2002). It was subsequently approved by the Council of Arab Ministers of Transport during its 15th Session (Cairo, Egypt, October 2002) under the umbrella of the League of Arab States. The final text of the agreement as developed by ACAC's Air Transport Committee was finalized and adopted by the Dubai Declaration on the Liberalization of Traffic Rights among Arab States on 23 October 2002.

Economic trends

6.27 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



Source: IMF, WEFA Group.

Figure 6-13. Annual change in real GDP and GDP per capita — Middle East (1991–2005)

region's GDP and GDP per capita over the 1991–2001 period. Oil-producing countries had suffered from declines in crude oil prices during the 1980s, and the Gulf War affected the region negatively in 1990–1991. With a return to political and economic stability in the region, GDP growth recovered quite strongly in 1992. Growth, varying in strength, was sustained for the following seven years. From 1991–2001, the aggregate GDP for the Middle East grew at an average annual rate of 3.9 per cent in real terms, while GDP per capita averaged a 1.4 per cent growth rate per annum.

6.28 In 2002, the economy of the region maintained the 2001 rate of 3.9 per cent real GDP growth. Political instability and tensions continued to have a marked negative influence on tourism and air travel to and from the region. Most affected were several States in which international tourism accounts for a substantial contribution to GDP such as Egypt, Lebanon and Jordan. Intra-regional air travel and tourism were not affected as seriously.

6.29 Rising oil prices and higher oil production at the beginning of the forecast period point to the volatility of terms of trade for that crucial commodity and its impact on the Middle-Eastern economies. In addition, higher oil prices and production have benefited oil-producing countries while oil importers in the region are suffering losses in international trade (including declining tourism receipts) and investment flows on account of the continued difficult political and security situation at various locations. The Middle-Eastern economies are expected to grow in aggregate, at 4, 4.4 and 4.3 per cent in 2003, 2004 and 2005, respectively.

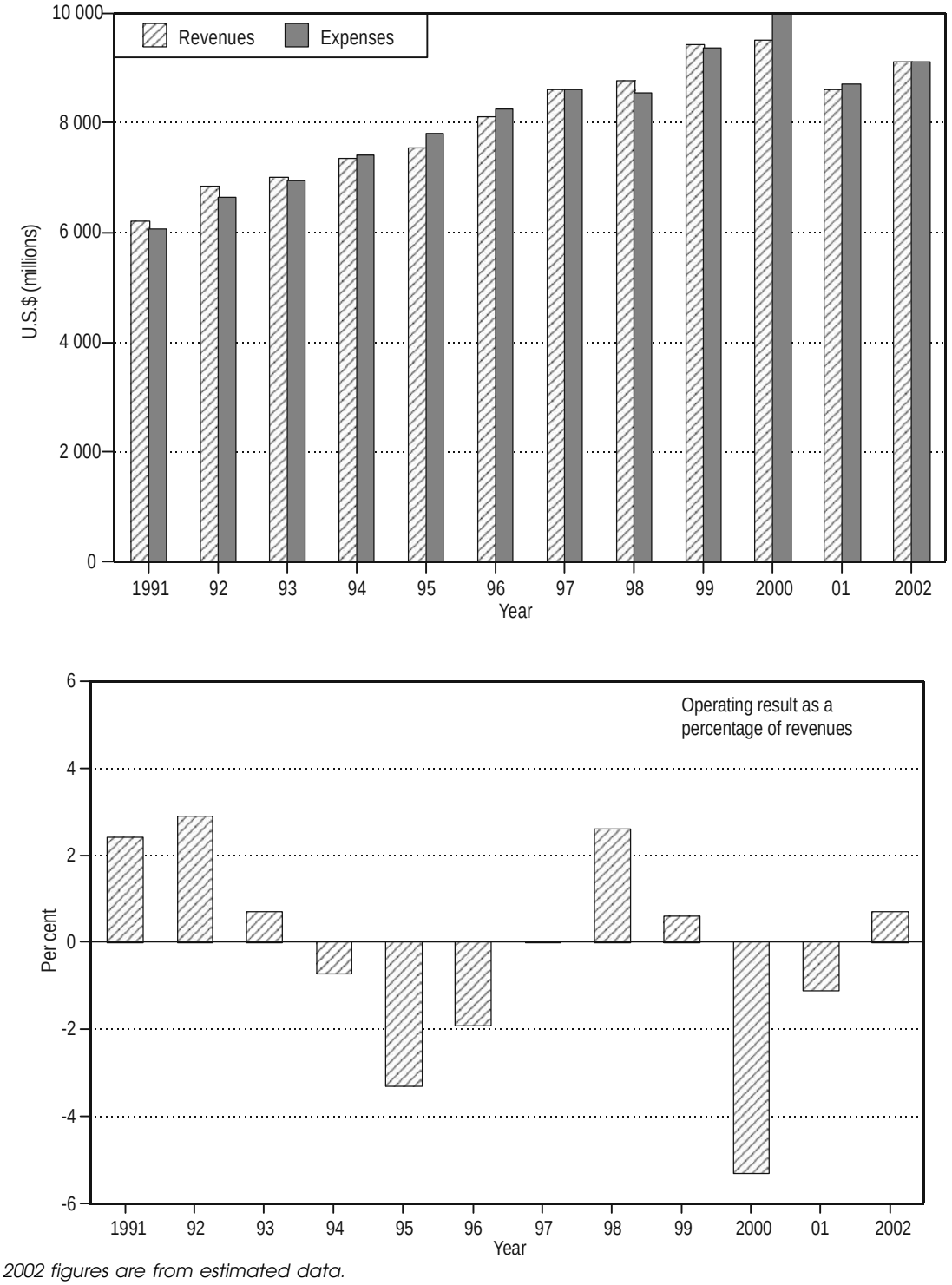
Airline financial trends

6.30 Over the 1991-2001 period, operating revenues of the scheduled airlines of the Middle East region increased at an average annual rate of 3.3 per cent (compared to the world annual average of 4.1 per cent). Operating expenses for the same period increased by 3.7 per cent per annum. As shown in Figure 6-14, since 1994 the airlines of the region have experienced a string of operating losses, except for 1998 and 1999. In 2002, it is estimated that a positive operating margin of 0.7 per cent was achieved. Traffic has grown continuously but capacity expansion has been even greater and unit costs remain comparatively high.

6.31 For the 1991-2001 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 5.4 per cent in real terms (compared to a 4.4 per cent decline for the world), with an exceptional increase in 1991. Real yield decreased substantially in 2000 and 2001, by some 9.8 and 12.2 per cent, respectively. In 2002, the decline in real yield was moderate, estimated at 4.5 per cent. The year-to-year comparisons of the changes in real passenger yields of Middle East and world airlines are illustrated in Figure 6-15.

Airline passenger traffic trends and forecast

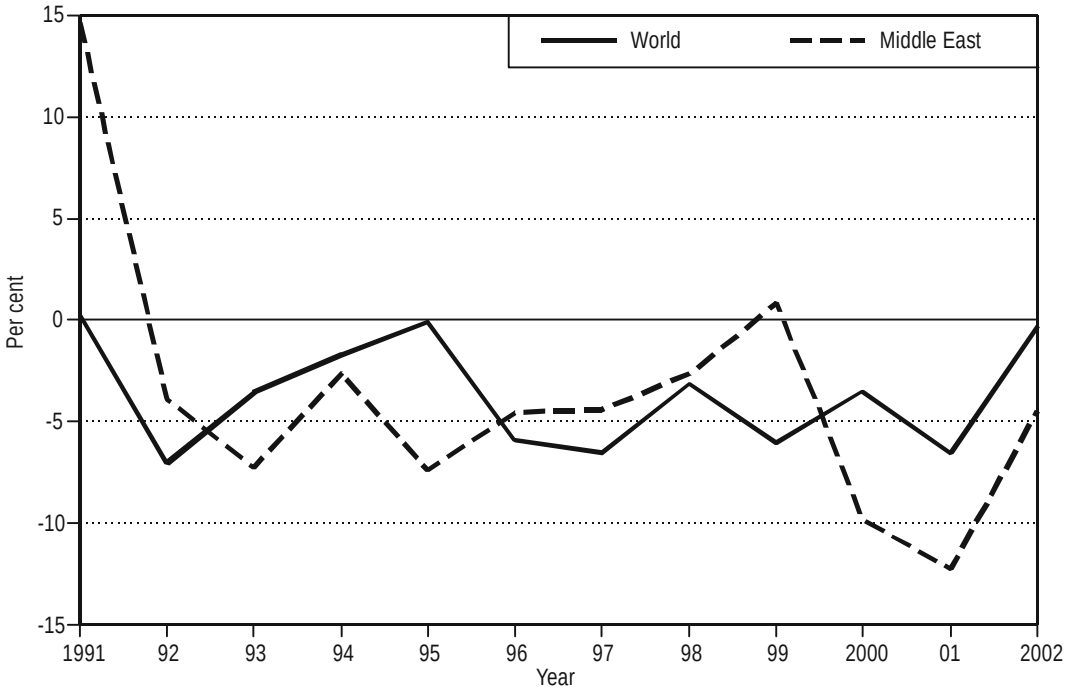
6.32 Over the 1991-2001 period, scheduled passenger traffic (in PKPs) of the airlines of the Middle East region increased at an average annual rate of 7.9 per cent. Traffic growth has



Note.— 2002 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF.

Figure 6-14. Scheduled airline operating revenues and expenses — Middle East (1991–2002)



Notes.— 2002 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 and EF.

Figure 6-15. Annual change in real scheduled passenger yield — Middle East and World (1991–2002)

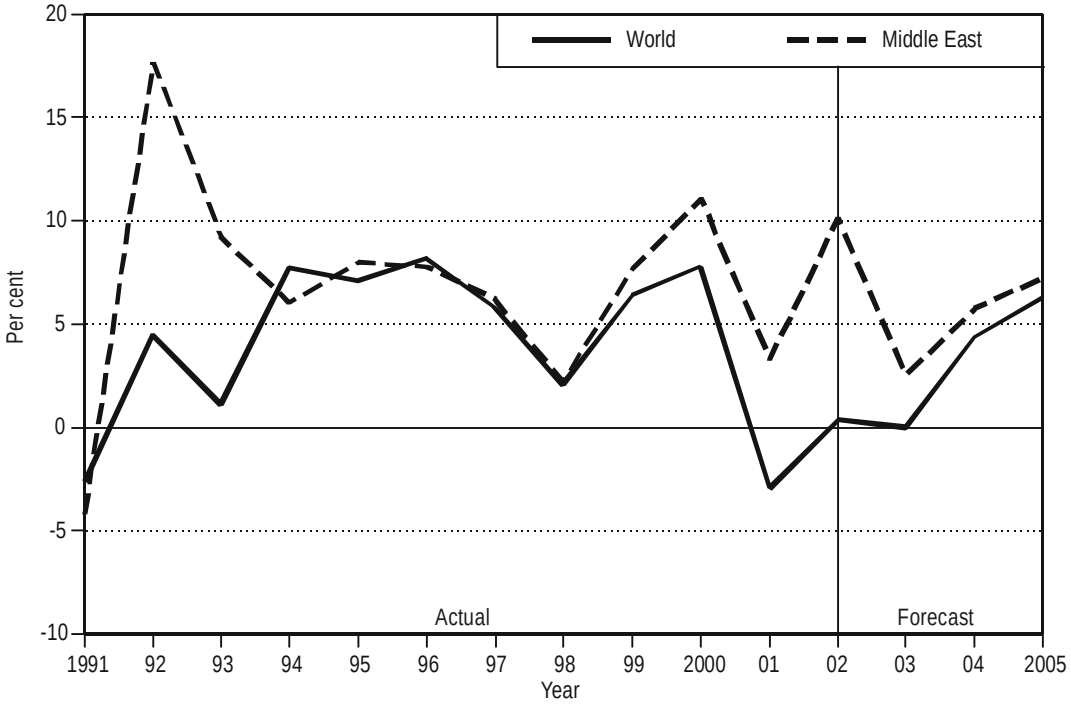
been reasonably buoyant since the declines in 1990 and 1991 associated primarily with the Gulf War. After a slowdown in 2001 following impressive growth of 11 per cent in the year 2000, total passenger traffic growth soared again at an estimated rate of about 10.1 per cent in 2002. Traffic performance details for airlines registered in the region are given in Table 6-4. The year-to-year traffic growth comparison between world and Middle East airlines is shown in Figure 6-16.

6.33 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 grow by 2.6 per cent in 2003, 5.8 per cent in 2004 and 7.2 per cent in 2005. These rates reflect expectations of a good economic performance in the region.

Table 6-4. Scheduled traffic — Airlines of the Middle East (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	31 420	13.5	5.8	50 140	9.7	3.1
Passenger-kilometres performed (millions)	93 490	11.0	5.4	106 700	10.1	3.6
Freight and mail tonne-km performed (millions)	5 340	18.1	5.2	5 450	18.0	4.5

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-16. Scheduled passenger traffic growth (PKPs) — Middle East and World (1991–2005)

NORTH AMERICA

Major civil aviation events and developments in 2002

6.34 Performance of air transport in North America was still overshadowed during 2002 by the aftermath of the events of 11 September 2001 and by a resurgent reluctance towards international air travel because of the possibility of a war in Iraq by year-end. In contrast, air cargo benefited from the recovering international trade in goods with total traffic, measured in terms of freight/mail TKPs, growing by 1 per cent and international traffic by 1.9 per cent.

6.35 In spite of a regional economic recovery, air carriers faced weak or even decreasing air travel demand as passenger traffic (in terms of total PKPs) in the region declined for a second consecutive year (see Table 6-5). Under the Air Transport Safety and System Stabilization Act, the U.S. Air Transport Stabilization Board granted about $4.6 billion to 426 U.S. carriers to compensate for their event-related financial crisis in late 2001. In a fiercely competitive air transport services market, several airlines nevertheless faced bankruptcy, often just narrowly managing cash-flow bottlenecks. Chapter 11 of the U.S. Bankruptcy Code was invoked to provide relief to three carriers (Vanguard Airlines, US Airways and United Airlines).

6.36 Airlines intensified strategies to improve revenue generation, profitability and load factors through yield management and marketing campaigns offering air fares and service quality attractive to loyal and new customers, additional market access via alliance partners and other measures, while tightly controlling operational costs and finetuning capacity in terms of flight frequencies, aircraft fleet and personnel. The average load factor of total commercial passenger traffic by airlines registered in North America improved from 70.3 per cent in 2001 to 72.1 per cent in 2002. Many North American air carriers deferred or reduced their aircraft orders or options and continued to reduce personnel. Security concerns made alternatives to high priced, high yield business travel (teleconferencing, fractional ownership, etc.) more inviting. On the cost side, the price of crude oil rose again to reach almost $30 per barrel and pushed up jet fuel prices subsequently.

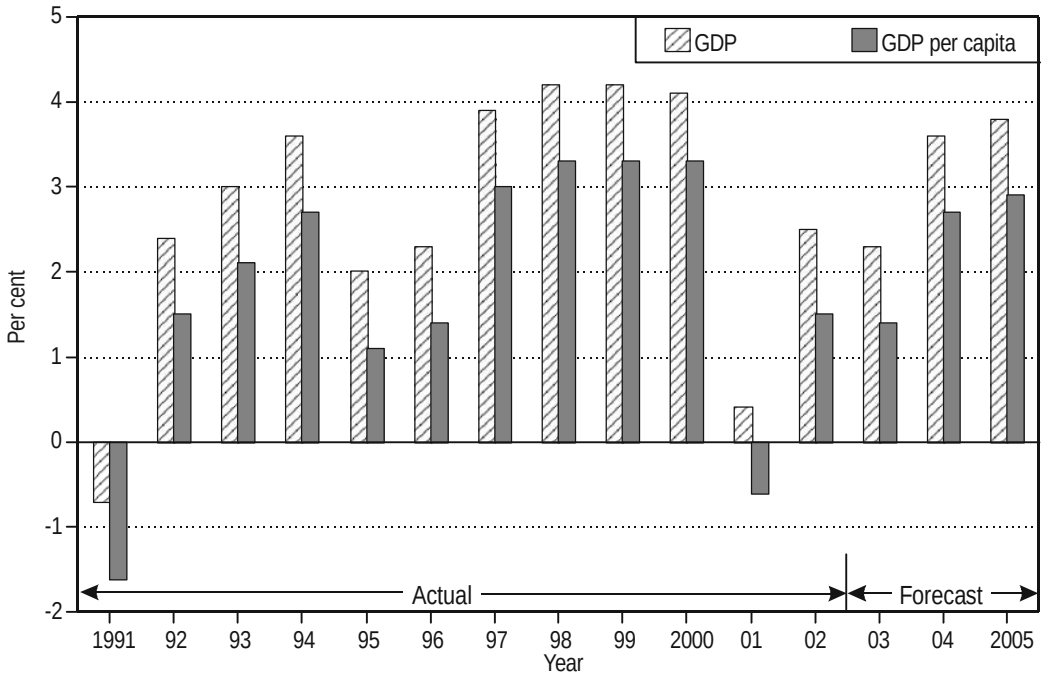
6.37 North American airports also continued to suffer from deteriorating financial results: the weakened traffic demand led to revenue losses from aeronautical and non-aeronautical activities while security and insurance costs were on the rise. The hub-and-spoke concept came under scrutiny as one of the measures taken by airlines to reduce airport services costs by utilizing people, gates and aircraft more productively; for instance, American Airlines began to de-peak flights at its two hubs Dallas Fort Worth (Texas) and Chicago O'Hare (Illinois).

6.38 A Canadian Air Transport Security Authority was created as a non-profit corporation responsible for all screening at airports. Also in Canada, a three-year agreement to stimulate domestic travel was signed by the Government of Quebec and Air Canada, covering travel by government employees and agencies throughout the province-wide route network of the regional Air Canada subsidiary "Jazz".

Economic trends

6.39 Over the 1991–2001 period, the North American GDP grew at an average annual rate of 3.1 per cent in real terms and GDP per capita increased at 2.1 per cent. The U.S. economic expansion, which began in 1991, has been the longest since 1945. By the end of 2000, though, an economic slowdown had affected economic activities with a worsening impact since the events of 11 September 2001. As a result, the year 2001 saw slow GDP growth of 0.4 per cent for the North American region. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-17.

6.40 The U.S. economy recovered and grew by 2.4 per cent during 2002; the North American region's economy reflected this recovery and grew by 2.5 per cent, helped by lower short-term and long-term interest rates. Consolidation is expected for the remainder of the forecast period, with the region's GDP projected to grow initially at a continuously modest rate of 2.3 per cent before accelerating to rates of 3.6 and 3.8 per cent in 2004 and 2005, respectively.



Source: IMF, WEFA Group.

Figure 6-17. Annual change in real GDP and GDP per capita — North America (1991–2005)

Airline financial trends

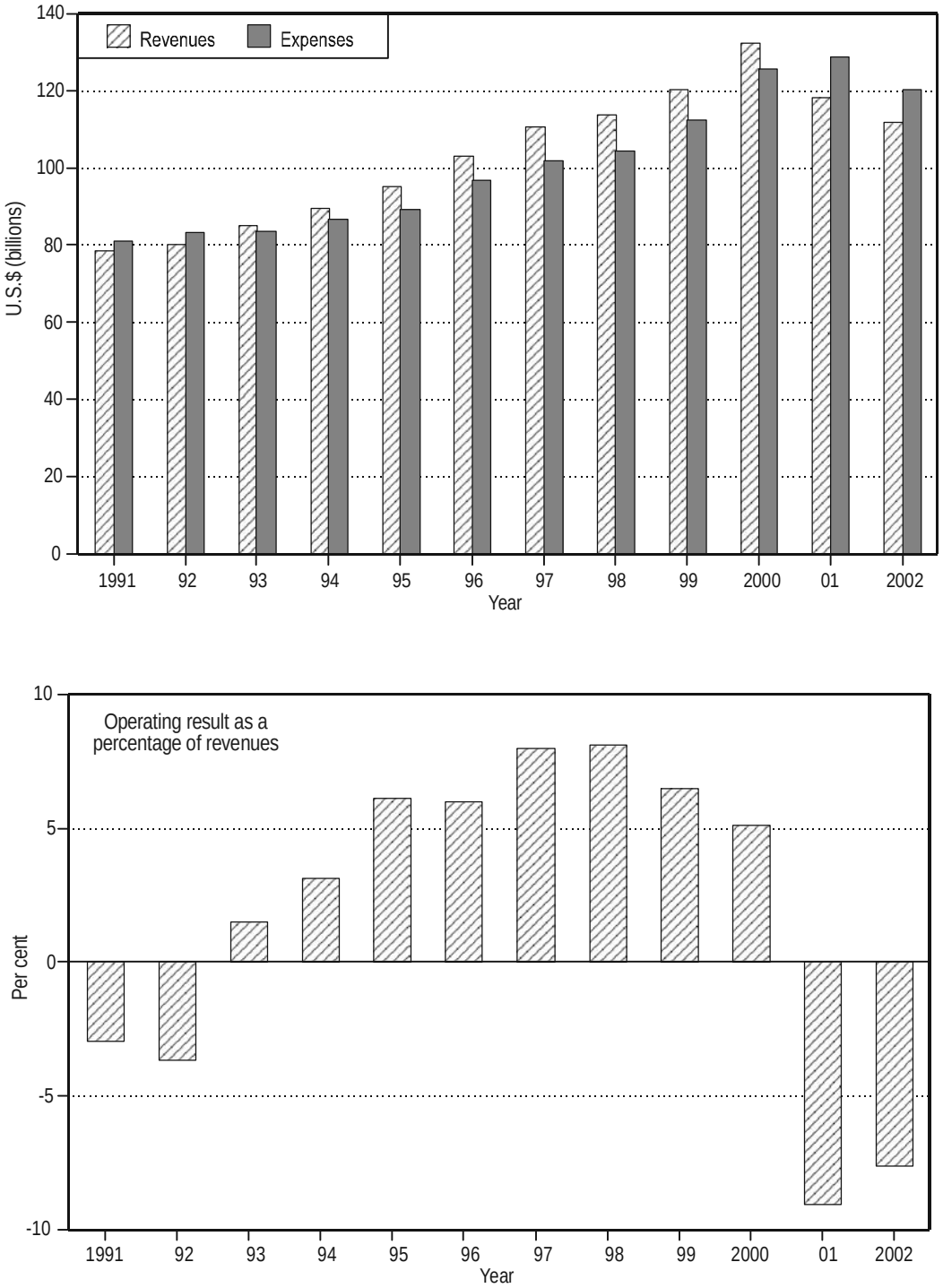
6.41 Over the 1991-2001 period, operating revenues of the scheduled airlines of the North American region increased at an average annual rate of 4.2 per cent (compared to the world annual average of 4.1 per cent). Operating expenses for the same period increased by 4.8 per cent per annum. Following a three-year period of deficits, an operating surplus was achieved in 1993 and continued for seven consecutive years as illustrated in Figure 6-18. The airlines of the region were the most affected by the economic slowdown and the ramifications of the events of 11 September 2001. The operating deficit experienced by these airlines is estimated at about 9 per cent of operation revenues in 2001 and 8 per cent in 2002.

6.42 For the 1991-2001 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 3.1 per cent in real terms (compared to a 4.4 per cent decline for the world). In 2000, industry-wide real yield increased somewhat over the previous year, triggered by increases in fuel prices and hence fares. However, it declined by 10 per cent in 2001, due mainly to the significant decline in demand and the resulting pressure on prices. In 2002, real yield is estimated to have declined moderately by 4.6 per cent due mainly to capacity reductions and the resulting gains in the pricing power of the airline industry. The year-to-year comparison of the changes in the real passenger yields of North American and world airlines is illustrated in Figure 6-19.

Airline passenger traffic trends and forecast

6.43 Over the 1991-2001 period, scheduled passenger traffic (in PKPs) of the airlines of the North American region increased at an average annual rate of 3.9 per cent (compared to the world average of 4.7 per cent). Traffic declines in 2001 and 2002 were the highest of all regions. Traffic performance details for airlines registered in the region are given in Table 6-5. The year-to-year traffic growth comparisons between world and North American airlines are shown in Figure 6-20.

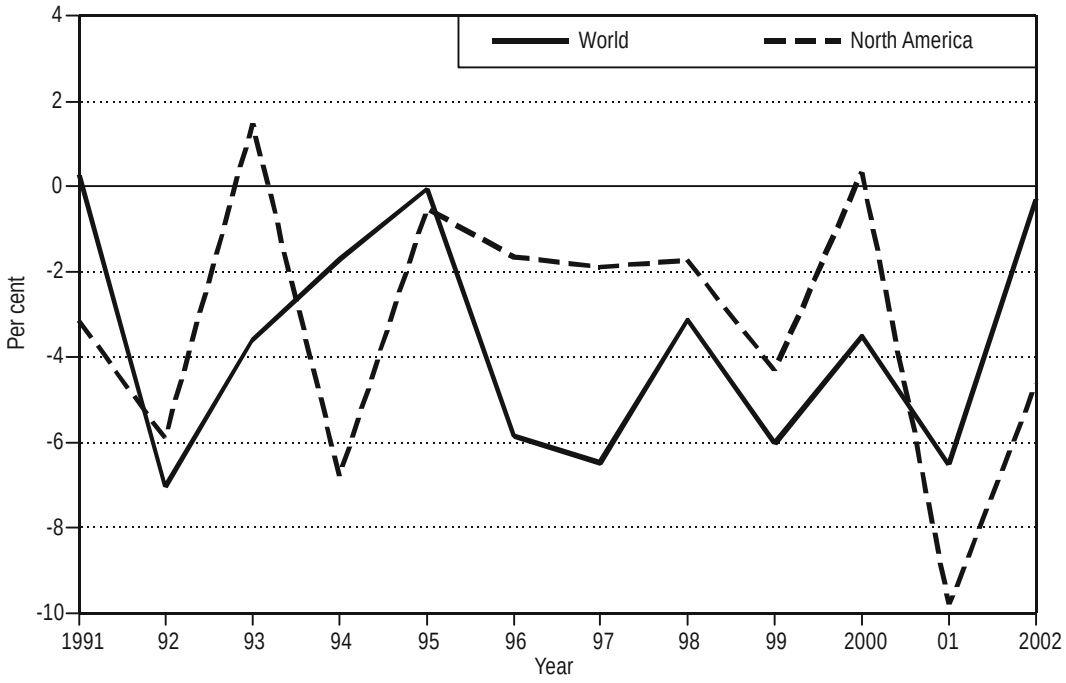
6.44 As shown in Table 5-6 and illustrated in Figure 6-20, scheduled passenger traffic for the airlines of the North American region is expected to stabilize in 2003 and to recover with growth of 3.9 per cent in 2004 and 5.8 per cent in 2005. Although the forecast rates for 2004 and 2005 are below the expected growth pattern for the world as a whole (4.4 and 6.3 per cent for the same two years), they represent impressive absolute growth considering the traffic volume of the region.



Note.— 2002 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF.

Figure 6-18. Scheduled airline operating revenues and expenses — North America (1991–2002)



Notes.— 2002 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

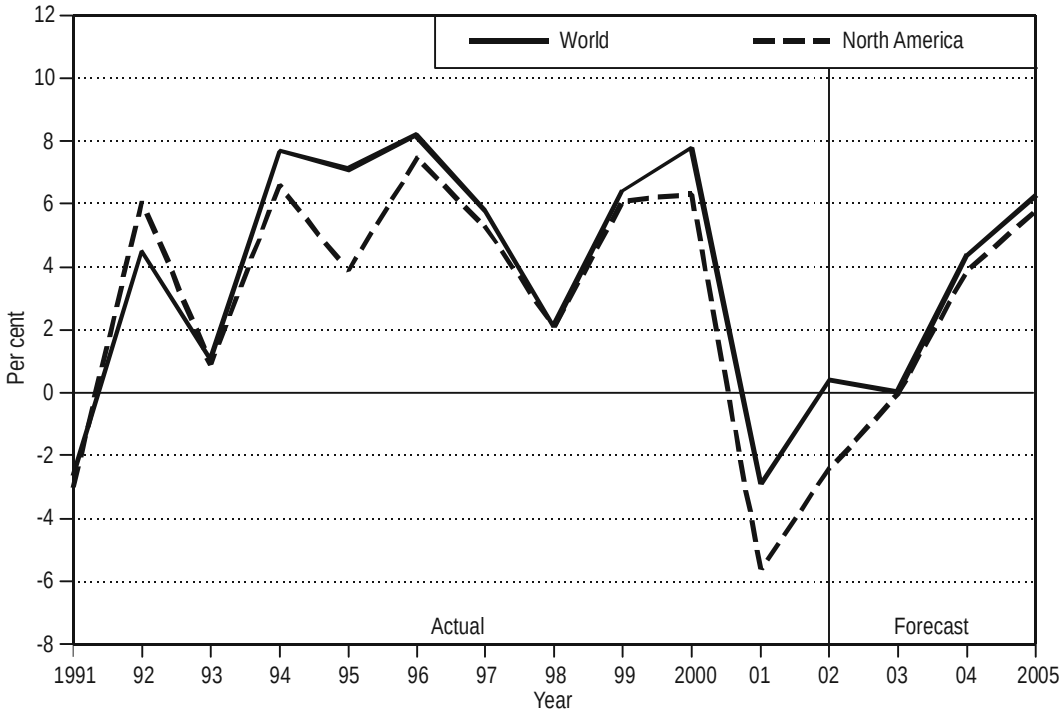
Source: ICAO Air Transport Reporting Forms A and EF.

Figure 6-19. Annual change in real scheduled passenger yield — North America and World (1991–2002)

Table 6-5. Scheduled traffic — Airlines of North America (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	74 180	–2.3	13.6	615 140	–4.2	38.1
Passenger-kilometres performed (millions)	322 360	–2.5	18.6	1 082 340	–2.4	36.8
Freight and mail tonne-km performed (millions)	21 010	1.9	20.3	32 630	1.0	26.9

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-20. Scheduled passenger traffic growth (PKPs) — North America and World (1991–2005)

LATIN AMERICA AND THE CARIBBEAN

Major civil aviation events and developments in 2002

6.45 Airlines and airports of Latin America and the Caribbean have long been affected by the adverse effects of both international and regional externalities on air travel markets and markedly so since 1998. The economic slowdown and 11 September 2001 events in the U.S., deteriorating conditions on regional financial markets, persistent decline of prices of most export commodities and manufactures, and the ongoing economic crisis in States of the "Mercado Común del Sur" (MERCOSUR) are crucial factors which have combined to delay a regional economic recovery. Service exports suffered lost business notably in the Caribbean Community, MERCOSUR States, Mexico and the Dominican Republic. Entertainment, transport and tourism business were impacted by declining tourists arrivals, mainly from the United States, Canada and Europe. Air transport industries claimed governmental support to combat the deepening economic crisis in the region and rising costs including those of insurance, fuel and security measures. Out of 39 IATA member airlines in Latin America, 36 incurred losses.

6.46 The Second Latin American Meeting of Ministers of Transport and Civil Aviation Authorities (Santiago de Chile, April 2002) developed agreements on competition conditions and established working groups charged with national implementation. Measures to reduce costs of air transport operations and a broad review of national rules and regulations involve: (a) procedures for reviewing and establishing concessions and charges for airport and air navigation services as well as duties and taxes currently levied; (b) creation of consultative airport users committees; (c) ratification of the Annex 4(a) "Agreement on Trade in Civil Aircraft" of the World Trade Organization and the *Convention on International Interests in Mobile Equipment* and its Protocol on Matters specific to Aircraft Equipment; (d) obtaining full allocation of revenues generated by civil aviation activities to service providers and related authorities; and (e) encouraging alliances and cooperation among airlines of the region.

6.47 Moreover, the Governments of Central American States adopted common actions for supporting and reinforcing their tourism industries, including provision of suitable air transport services. Towards this direction, the 12th Summit of Heads of State and Government of Central America (San Jose, Costa Rica, December 2002) considered diverse integration tools, such as the creation of a Central American Touristic and Cultural Corridor as well as a Free Transit Touristic Zone in order to harmonize political, migration, customs and transportation matters. The Summit developed a Tourism Plan of Action aimed at integrated sub-regional tourism and air transport policies.

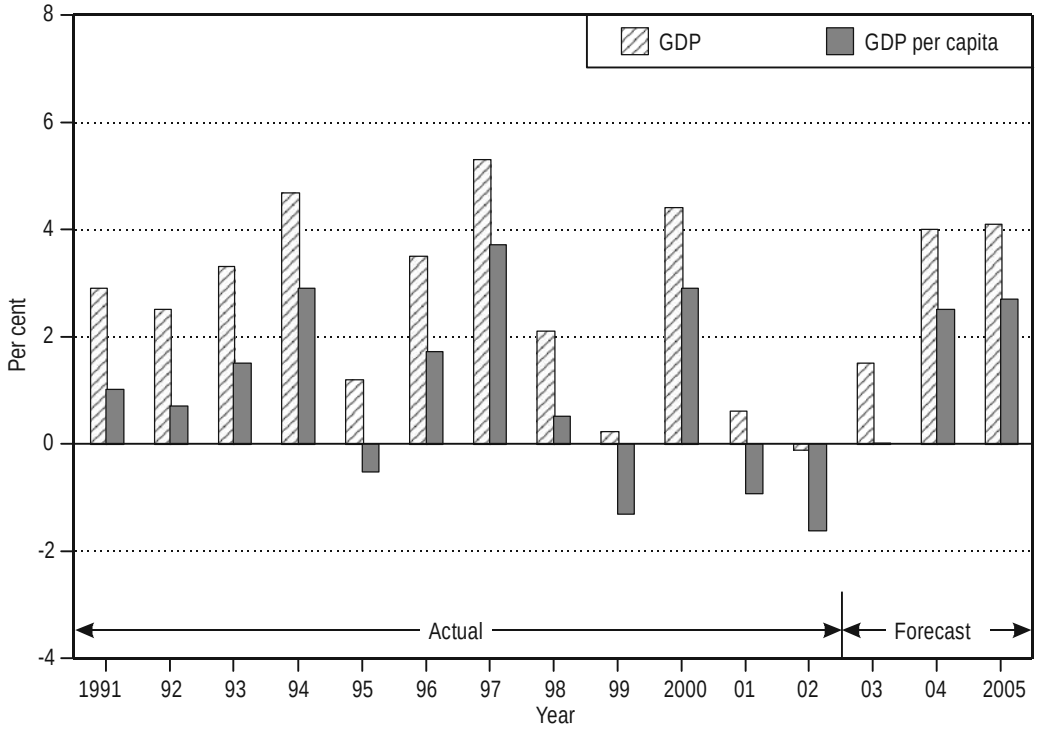
Economic trends

6.48 Over the 1991–2001 period, the aggregate Latin American and Caribbean economy (GDP) grew at an average annual rate of 2.8 per cent in real terms, whereas GDP per capita

grew at 1.1 per cent. A robust recovery had started in 1991 after a severe recessionary period in the late 1980s. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-21.

6.49 After record 5.3 per cent growth in GDP in 1997, the regional economy declined to 2 per cent growth in 1998 and further to 0.2 per cent growth in 1999. Financial market setbacks led Brazil to introduce severe austerity measures; other countries in the region such as Peru, Ecuador, El Salvador, Honduras and Nicaragua suffered from the adverse affects of repeated natural disasters which resulted in constricted output, especially due to devastation in the agricultural sector and industrial infrastructures and, consequently, declining exports and overall economic performance. The aggregate economic growth of Latin America nevertheless rebounded in 2000 to 4.4 per cent, in part as a result of the implementation of strong adjustment measures in many countries, but slumped again towards stagnancy in 2001 (0.6 per cent growth) and 2002 (-0.1 per cent).

6.50 It is expected that the aggregate performance of the Latin American economy will improve in 2003 to grow at a 1.5 per cent real GDP rate. For 2004 and 2005, the region's aggregate GDP is projected to accelerate its growth to 4 and 4.1 per cent, respectively.



Source: IMF, WEFA Group.

Figure 6-21. Annual change in real GDP and GDP per capita — Latin America and the Caribbean (1991–2005)

Airline financial trends

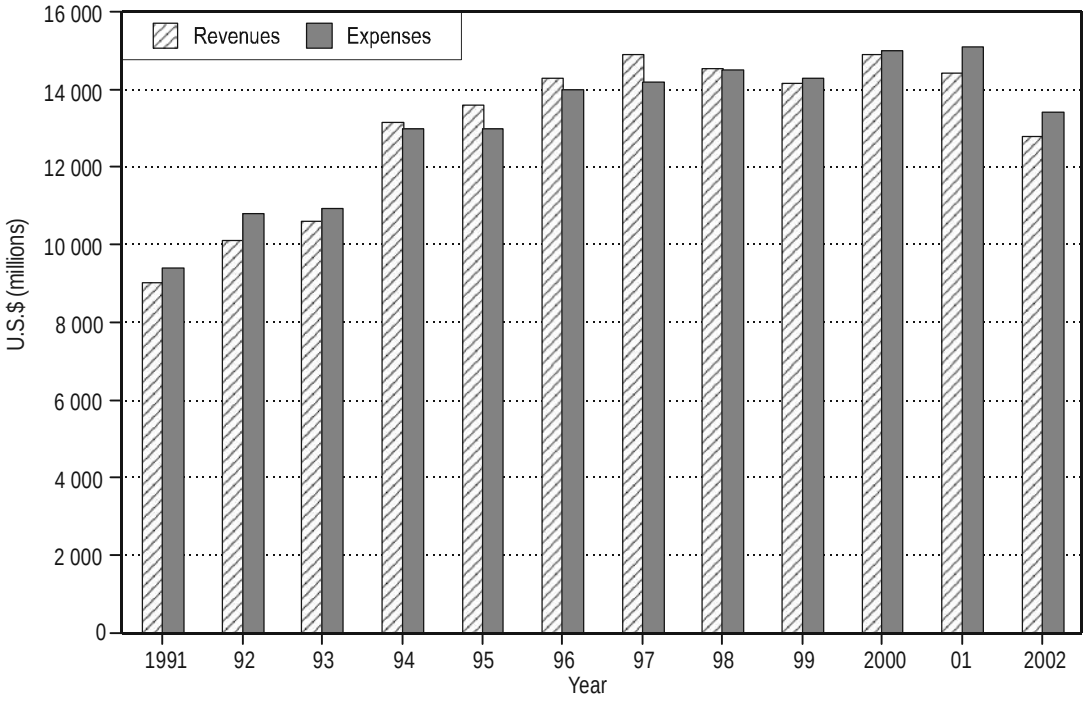
6.51 Over the 1991-2001 period, operating revenues of the scheduled airlines of the Latin American and Caribbean region increased at an average annual rate of 4.8 per cent (compared to the world annual average of 4.1 per cent). Operating expenses for the same period increased by 4.9 per cent per annum. As illustrated in Figure 6-22, the overall financial performance of the airlines of the region has been poor over the whole period, which commenced with three years of operating losses. A concerted effort of drastic cost-cutting, airline industry restructuring and demand recovery led to a significant turn-around and brought positive operating results for five consecutive years (1994-1998). Many airlines had returned to profitability by 1995 and were reporting healthy net results in 1997 and 1998. The trend reversed in 1999 when an operating loss of 1.1 per cent of operating revenues was incurred by the region's airline industry. The negative trend continued in 2000 and 2001 with operating losses of some $100 million (or 0.6 per cent of revenues) and $700 million (or about 5 per cent of revenues), respectively. For 2002, preliminary estimates indicate an operating loss of about $550 million (or 4.3 per cent of revenues).

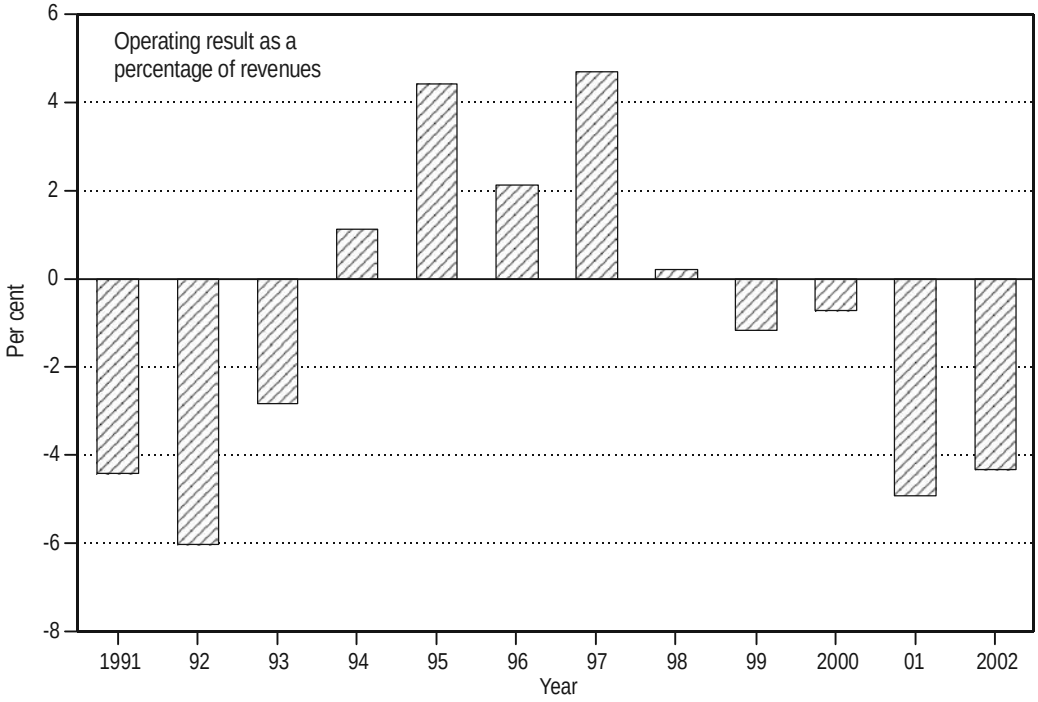
6.52 Average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP and expressed in constant price terms, fluctuated substantially between 1991 and 2001 while overall yield fell by an average of 1.8 per cent annually but with significant declines in recent years (except for 2000). The year-to-year comparisons of the changes in real passenger yield of Latin American and the Caribbean and world airlines are illustrated in Figure 6-23.

Airline passenger traffic trends and forecast

6.53 Over the 1991-2001 period, the scheduled passenger traffic (in PKPs) of airlines of the Latin America and the Caribbean region increased at an average annual rate of 4.4 per cent (compared to the world average growth rate of 4.7 per cent). In recent years, flag carrier privatization, intra-regional mergers and alliances along with extensive fleet and route rationalization were among the measures that enabled airlines of the region to capture a larger share of United States — Latin America and Caribbean traffic, one of the world's fastest growing aviation markets. Following very high traffic growth rates for 1997 and 1998 (9.6 and 7.8 per cent, respectively), total passenger traffic dropped in 1999 by 0.5 per cent, rebounded in 2000 with a 5.7 per cent growth, then declined again by 5.3 and 1.5 per cent in 2001 and 2002, respectively. Traffic performance details for airlines registered in the region are given in Table 6-6. The year-to-year traffic growth comparison between world and Latin American and the Caribbean airlines is shown in Figure 6-24.

6.54 Traffic growth is expected to recover progressively over the medium term along with economic activity. As shown in Table 5-6 and illustrated in Figure 6-24, scheduled passenger traffic of the airlines of the Latin America and the Caribbean region is expected to grow by 1.5, 4.8 and 6.8 per cent in 2003, 2004 and 2005, respectively, comparable to the expected growth trend for the world (0, 4.4 and 6.3 per cent).

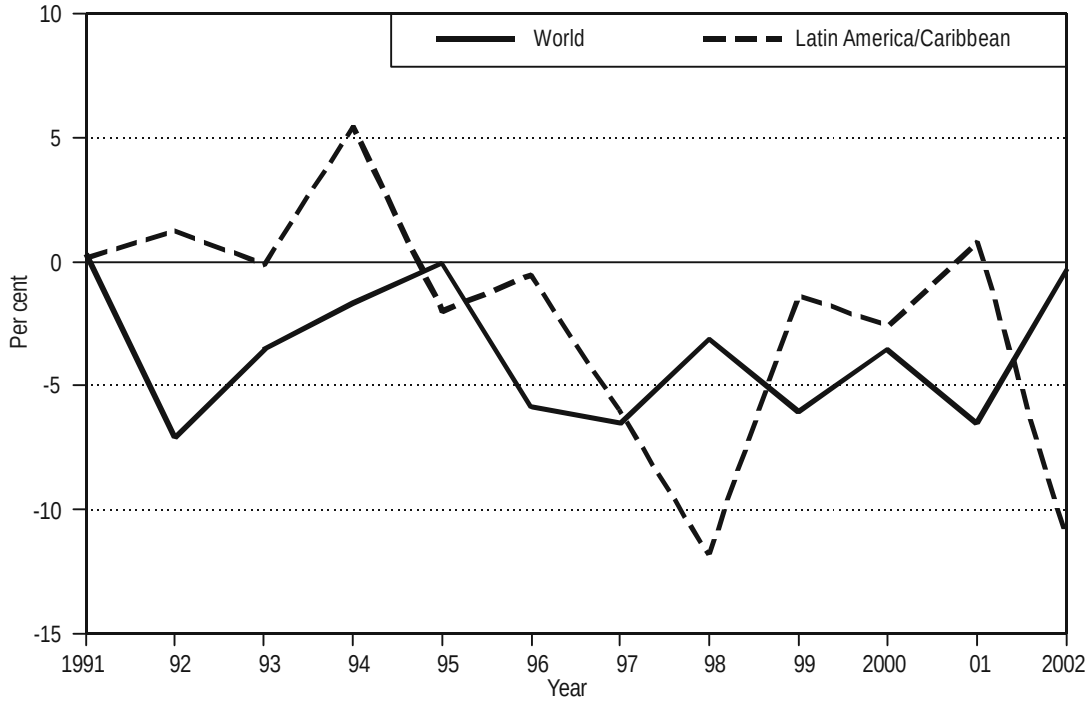




Note.— 2002 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF.

Figure 6-22. Scheduled airline operating revenues and expenses — Latin America and the Caribbean (1991–2002)



Notes.— 2002 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

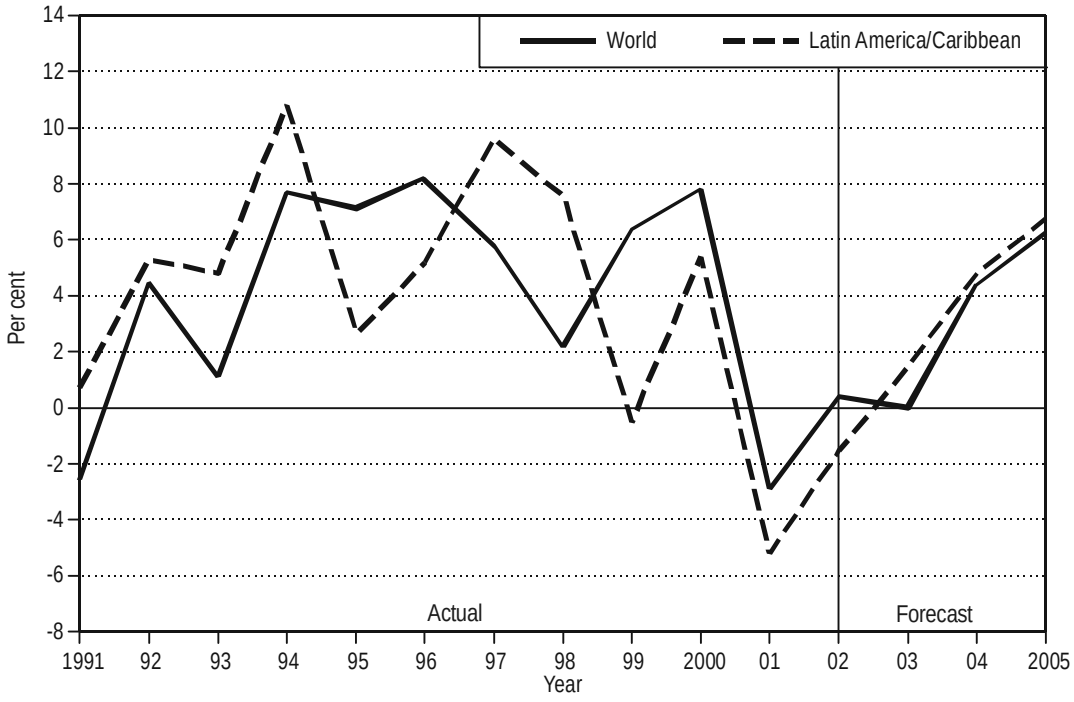
Source: ICAO Air Transport Reporting Forms A and EF.

Figure 6-23. Annual change in real scheduled passenger yield — Latin America and the Caribbean and World (1991–2002)

Table 6-6. Scheduled traffic — Airlines of Latin America and the Caribbean (2002/2001)

	INTERNATIONAL			TOTAL		
	2002	Change over 2001 (%)	Share of world traffic (%)	2002	Change over 2001 (%)	Share of world traffic (%)
Passengers carried (thousands)	26 390	–5.5	4.8	97 100	–1.0	6.0
Passenger-kilometres performed (millions)	77 380	–1.4	4.5	132 330	–1.5	4.5
Freight and mail tonne-km performed (millions)	3 130	–11.1	3.0	4 040	–5.8	3.3

Source: ICAO Air Transport Reporting Form A.



Source: ICAO.

Figure 6-24. Scheduled passenger traffic growth (PKPs) — Latin America and the Caribbean and World (1991–2005)

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APPENDICES

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Appendix 1
Economic Regulation Tables

Table A1-1. Bilateral "open skies" agreements, 1992 to 2002

1992	Netherlands – United States
1995	Austria – United States
1995	Belgium – United States
1995	Czech Republic – United States (7C, T)
1995	Denmark – United States
1995	Finland – United States
1995	Iceland – United States (7C)
1995	Luxembourg – United States (7C)
1995	Norway – United States
1995	Sweden – United States
1995	Switzerland – United States
1996	Germany – United States (7C, FN)
1996	Jordan – United States
1997	Aruba – United States (7C)
1997	Brunei Darussalam – Singapore (S)
1997	Brunei Darussalam – United States (7C, S)
1997	Chile – United States (7C, S)
1997	Costa Rica – United States
1997	El Salvador – United States (7C)
1997	Guatemala – Panama
1997	Guatemala – United States (7C)
1997	Honduras – United States (7C)
1997	Kenya – Netherlands
1997	Malaysia – New Zealand (O, FF)
1997	Malaysia – United States (7C, T)
1997	Netherlands Antilles – United States (7C)
1997	New Zealand – Singapore (7C, FF, O, S)
1997	New Zealand – United States (7C, FN, S)
1997	Nicaragua – United States (7CC)
1997	Panama – United States (7C)
1997	Romania – United States (T)
1997	Singapore – United States (7SC, S)
1997	Taiwan, Province of – United States
1998	Brunei Darussalam – New Zealand (7, 8, FF, O, S)
1998	Chile – New Zealand (7C, FF, O, R, S)
1998	Chile – Panama
1998	Denmark – New Zealand (FF)
1998	Turkmenistan – United Arab Emirates
1998	United Arab Emirates – Uganda
1998	Uzbekistan – United States (7C)
1999	Argentina – United States (7C, FN, SS, T)
1999	Bahrain – United States (7C)
1999	Chile – Costa Rica (R)
1999	Dominican Republic – United States (7C)
1999	Ireland – New Zealand (7, 8, R)
1999	New Zealand – Peru (7C, FF, S)
1999	New Zealand – Switzerland (O, R)
1999	Pakistan – United States (7C)
1999	Portugal – United States (7C, T)
1999	Qatar – United States (7C)
1999	Tanzania, United Republic of – United States (7C, T)
1999	United Arab Emirates – United States (7C)
2000	Australia – New Zealand (7C, 8, FF, O)
2000	Benin – United States (7C)
2000	Burkina Faso – United States (7C)
2000	Cook Islands – New Zealand (O)
2000	Gambia – United States (7C, T)
2000	Ghana – United States (7C, T)
2000	Malta – United States (7C, T)
2000	Morocco – United States (7C, T)
2000	Namibia – United States (T)
2000	New Zealand – Samoa (O, S, T)
2000	Nigeria – United States (7C, T)
2000	Rwanda – United States (7C, FN, T)
2000	Senegal – United States (7C, FN, T)
2000	Slovakia – United States (7C, T)
2000	South Africa – Zimbabwe
2000	Turkey – United States (T)
2001	Cook Islands – Samoa
2001	France – United States (7C, FN)
2001	Oman – United States (7C, T)
2001	Poland – United States (7C, FN, T)
2001	Samoa – Tonga
2001	Sri Lanka – United States (T)

1998 Ethiopia – United Arab Emirates
1998 Italy – United States
1998 New Zealand – Norway (FF)
1998 New Zealand – Sweden (FF)
1998 Peru – United States (7C, S, T)
1998 Republic of Korea – United States
2002 Cape Verde – United States (7C, FN)
2002 Chile – Peru (T, S)
2002 Jamaica – United States (T)
2002 New Zealand – Tonga (7, FF, O)
2002 Singapore – United Arab Emirates (7)
2002 Uganda – United States (7C, FN)

Notes.—
— 7 denotes "Seventh Freedom" rights for all services;
— 7C, 7CC and 7SC denote "Seventh Freedom" rights for all-cargo, charter all-cargo and scheduled all-cargo services;
— 8 denotes "Eighth Freedom" rights for all services;
— FF denotes a free pricing scheme;
— FN denotes a double disapproval tariff scheme without tariff filing requirements;
— O denotes a liberal ownership provision;
— R denotes an existence of provisions less liberal than comparable ones in other "open skies" agreements;
— S denotes suspension due to entry into force of the "Kona" Agreement (and its Protocol in some cases);
— SS denotes suspension by one of the parties;
— T denotes the existence of a transition annex or similar clause.

Source: ICAO Bilateral Agreement Database and aviation press.

Table A1-2. Regulatory actions on proposed alliances

Proposed alliances	Submission	Tentative decision	Final decision	Notes
The U.S. Department of Transportation (DOT)'s antitrust immunity cases				
Pan American Airways – Aeroflot	1988	1988(D)	1989(A)	Partnership ended in 1991
Northwest Airlines – KLM	1992	1992(A)	1993(A)	
Delta Air Lines – Austrian Airlines – Sabena – Swissair	1995	1996(A)	1996(A)	Partnership ended in 2000
American Airlines – Canadian Airlines	1995	1996(A)	1996(A)	Partnership ended in 2000
United Airlines – Lufthansa	1996	1996(A)	1996(A)	
United Airlines – Lufthansa – SAS	1996	-	1996(A)	
United Airlines – Air Canada	1996	1997(A)	1997(A)	
American Airlines – British Airways (I)	1997	-	1999(D)	
American Airlines – LanChile	1997	1999(A)	1999(A)	
Northwest Airlines – Alitalia – KLM	1999	1999(A)	1999(A)	Partnership ended in 2000
American Airlines – Sabena – Swissair	1999	2000(A)	2000(A)	Partnership ended in 2001-02
United Airlines – Air New Zealand	1999	2001(A)	2001(A)	
Northwest Airlines – Malaysia Airlines	2000	—	2000(A)	
Icelandair – SAS	2000	—	2000(A)	
United Airlines – Austrian Airlines – Lauda Air – Lufthansa – SAS	2000	—	2001(A)	
Continental Airlines – COPA	2000	—	2001(A)	
American Airlines – Grupo TACA	2000	Pending	Pending	Carriers requested DOT to dismiss the application in 2002
Delta Air Lines – Air France – Alitalia – CSA Czech Airlines	2001	2001(A)	2002(A)	
American Airlines – British Airways (II)	2001	2002(A*)	2002(D)	*: Subject to the achievement of U.S. – U.K. "open skies" agreement within a specific period
United Airlines – Austrian Airlines – bmi British Midland – Lauda Air – Lufthansa –SAS	2001	2002(A*)	2002(A*)	*: Subject to the achievement of U.S. – U.K. "open skies" agreement within a specific period
American Airlines – Finnair	2002	—	2002(A)	
American Airlines – Swiss International Air Lines	2002	—	2002(A)	
Delta Air Lines – Air France – Alitalia – CSA Czech Airlines – Korean Air	2002	—	2002(A)	
The U.S. Department of Transportation (DOT)'s other cases				
Northwest Airlines – KLM	1989	—	1989(A)	Equity transactions; Conditions were amended in 1991
USAir – British Airways	1992	1992(#)	1993(A)	Equity transactions and related subsidiary agreements; Partnership ended in 1996
Continental Airlines – Northwest Airlines	1998	—	2000(A)	Equity transactions; DOJ's antitrust lawsuit
United Airlines – US Airways	2002	—	2002(A)	Marketing agreement between U.S. airlines
Continental Airlines – Delta Air Lines – Northwest Airlines	2002	Pending	Pending	Marketing agreement between U.S. airlines

Proposed alliances	Submission	Tentative decision	Final decision	Notes
The European Commission				
Air France – Sabena	1992	—	1992(A)	Approved under the merger regulation; Partnership ended in 1995
British Airways – USAir (US Airways)	1993	—	—	Partnership ended in 1996, making investigation obsolete
Sabena – Swissair	1995	—	1995(A)	Approved under the merger regulation; Partnership ended in 2001
Lufthansa – SAS	1995	1995(A)	1996(A)	
Alitalia – KLM	1999	—	1999(A)	Approved under the merger regulation; Partnership ended in 2000
bmi British Midland – Lufthansa – SAS	2000	—	2001(A)	
Austrian Airlines – Lufthansa	1999	2000(#), 2001(D)(A)	2002(A)	
Austrian Airlines – Sabena – Swissair – Delta Air Lines	1996	—	—	Investigation was initiated without notification from the carriers; Partnership ended in 2000, making investigation obsolete
British Airways – American Airlines (I)	1996	1998(A#)	—	Investigation was initiated without notification from the carriers; The U.K. Department of Trade and Industry tentatively approved in 1996; Investigation was virtually closed in 1999 due to DOT's dismissal
KLM – Northwest Airlines	1996	2002(A)	2002(A)	Investigation was initiated without notification from the carriers
Lufthansa – SAS – United Airlines	1996	1998(A#), 2002(A)	2002(A)	Investigation was initiated without notification from the carriers
Air France – Continental Airlines	1998	—	—	Investigation was initiated without notification from the carriers; Partnership ended in 2001, making investigation obsolete
Air France – Delta Air Lines	1998	Pending	Pending	Investigation was initiated without notification from the carriers; The coverage was extended to SkyTeam in 2002
Austrian Airlines – SAS	1999	2000(#)	Pending	
Air France – Alitalia	2001	2002(#)	Pending	
bmi British Midland – United Airlines	2001	Pending	Pending	The U.K. Office of Fair Trading (OFT) approved in 2002
British Airways – American Airlines (II)	2001	—	—	Investigation was closed in 2002 after DOT's dismissal
British Airways – Iberia	2001	Pending	Pending	
British Airways – SN Brussels Airlines	2002	Pending	Pending	
British Airways – Finnair	2002	Pending	Pending	

Proposed alliances	Submission	Tentative decision	Final decision	Notes
The Australian Competition and Consumer Commission (ACCC)				
Qantas – British Airways (I)	1994	1994(D)	1995(A)	Authorization expired in 2000
Ansett – Air New Zealand – Singapore Airlines	1997	1998(A)	1998(A)	Partnership ended virtually in 2001-02
Qantas – British Airways (II)	1999	2000(A)	2000(A)	Renewal
Qantas – Air New Zealand	2002	Pending	Pending	The New Zealand Commerce Commission is also investigating

Notes.—
(A) denotes approval with or without conditions, or intention to approve with conditions
(D) denotes disapproval or intention to disapprove
(#) denotes expression of concerns or doubts

Source: U.S. DOT, European Commission, ACCC and aviation press.

Appendix 2
Statistical Tables

Table A2-1. Regional distribution of scheduled traffic — 2002

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	6 560	5 980	422 620	769 710	73	32 830	106 760	160 680	66
Percentage of world traffic	26.6	29.2	26.2	26.2		28.1	27.2	25.0	
Africa	590	490	29 920	66 220	65	1 860	7 920	14 990	53
Percentage of world traffic	2.4	2.4	1.9	2.3		1.6	2.0	2.3	
Middle East	700	440	50 140	106 700	71	5 350	15 200	25 170	60
Percentage of world traffic	2.8	2.1	3.1	3.6		4.6	3.9	3.9	
Asia and Pacific	5 010	3 740	400 320	785 110	71	42 060	114 530	179 140	64
Percentage of world traffic	20.3	18.2	24.8	26.7		36.1	29.2	27.8	
North America	10 300	8 130	615 140	1 082 340	72	30 590	131 030	233 050	56
Percentage of world traffic	41.7	39.7	38.1	36.8		26.2	33.4	36.2	
Latin America and Caribbean	1 540	1 720	97 100	132 330	61	3 940	16 360	30 620	53
Percentage of world traffic	6.2	8.4	6.0	4.5		3.4	4.2	4.8	
Total	24 700	20 490	1 615 240	2 942 410	71	116 630	391 790	643 640	61
International services of airlines of ICAO Contracting States									
Europe	5 050	3 440	263 720	643 840	74	32 020	94 360	140 230	67
Percentage of world traffic	42.8	57.7	48.4	37.2		31.8	35.5	34.1	
Africa	440	210	17 540	57 480	66	1 780	7 030	13 270	53
Percentage of world traffic	3.7	3.5	3.2	3.3		1.8	2.6	3.2	
Middle East	590	250	31 420	93 490	70	5 250	13 920	22 770	61
Percentage of world traffic	5.0	4.2	5.8	5.4		5.2	5.2	5.5	
Asia and Pacific	2 750	840	131 370	537 620	74	38 200	89 420	132 130	68
Percentage of world traffic	23.3	14.1	24.1	31.0		38.0	33.7	32.1	
North America	2 270	830	74 180	322 360	76	20 260	50 390	84 660	60
Percentage of world traffic	19.2	13.9	13.6	18.6		20.1	19.0	20.6	
Latin America and Caribbean	710	390	26 390	77 380	65	3 080	10 540	18 610	57
Percentage of world traffic	6.0	6.5	4.8	4.5		3.1	4.0	4.5	
Total	11 820	5 970	544 610	1 732 160	73	100 590	265 650	411 680	65

Source: ICAO Air Transport Reporting Form A.

Table A2-2. Number of turbojet and turboprop aircraft delivered, ordered and remaining to be delivered up to 31 December 2002[1]
(excludes military and government-operated aircraft)

Type of Aircraft	Before 2002	Delivered during 2002	Total as of 31/12/02	Ordered during 2002[2]	Remaining to be delivered as of 31/12/02[3]
TURBOJETS					
Airbus Industrie A300	507	9	516	0	66
Airbus Industrie A310	252	0	252	0	5
Airbus Industrie A318	0	0	0	0	84
Airbus Industrie A319	400	85	485	143	364
Airbus Industrie A320	1 010	116	1 126	43	469
Airbus Industrie A321	221	35	256	7	165
Airbus Industrie A330	212	42	254	8	168
Airbus Industrie A340	203	16	219	22	89
Airbus Industrie A380/380F	0	0	0	10	95
Boeing 717	93	20	113	12	39
Boeing 737	4 086	212	4 298	118	757
Boeing 747	1 277	27	1 304	17	48
Boeing 757	987	29	1 016	0	30
Boeing 767	855	33	888	4	38
Boeing 777	377	47	424	26	189
British Aerospace — 146/RJ 85/100	365	2	367	0	0
Canadair Regional Jet	586	186	772	44	389
Dornier DO-328/728/928 Jet	72	9	81	0	4
Embraer EMB -145/135/140/170/195	448	131	579	43	408
McDonnell-Douglas MD-80/90	1 305	0	1 305	0	0
McDonnell-Douglas MD-11	194	0	194	0	0
Total of aircraft in production	13 450	999	14 449	497	3 407
Total of aircraft not in production[4]	6 286		6 286		
Total turbojets	19 736	999	20 735	497	3 407
TURBO-PROPS					
Aerospatiale/Aeritalia ATR-42/72	629	20	649	16	19
DeHavilland Canada DHC-8	624	33	657	6	17
Dornier DO-228	141	4	145	1	1
SWEARINGEN Metro 23	109	0	109	0	0
Embraer EMB-120 Brasilia	352	0	352	0	0
Beechcraft 1900	637	12	649	0	0
CASA212/CASA-IPTN CN-235/295	181	0	181	9	37
Total of aircraft in production	2 673	69	2 742	32	74
Total of aircraft not in production[4]	3 430		3 430		
Total turbo-props	6 103	69	6 172	32	74

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 1997.

Table A2-3. Aircraft accidents involving passenger fatalities on scheduled air services, 1983-2002

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.								
1983	21	817	0.08	0.13	0.23	0.37	0.14	0.20
1984	16	218	0.02	0.03	0.16	0.26	0.10	0.14
1985	25	1 037	0.09	0.14	0.24	0.39	0.15	0.21
1986	19	427	0.03	0.05	0.17	0.27	0.10	0.15
1987	23	889	0.06	0.10	0.19	0.31	0.12	0.18
1988	26	712	0.05	0.08	0.21	0.33	0.13	0.19
1989	29	879	0.06	0.09	0.22	0.36	0.13	0.21
1990	23	473	0.03	0.05	0.17	0.27	0.10	0.16
1991	24	518	0.03	0.05	0.17	0.28	0.11	0.17
1992	24	972	0.05	0.09	0.16	0.26	0.10	0.17
1993	31	806	0.04	0.07	0.20	0.32	0.13	0.21
1994	23	961	0.05	0.08	0.14	0.22	0.09	0.14
1995	20	541	0.02	0.04	0.11	0.18	0.07	0.12
1996	21	1 125	0.05	0.08	0.11	0.18	0.07	0.12
1997	24	859	0.03	0.05	0.12	0.19	0.07	0.13
1998	20	904	0.03	0.06	0.10	0.15	0.06	0.11
1999	20	498	0.02	0.03	0.09	0.15	0.06	0.10
2000	18	755	0.03	0.04	0.08	0.12	0.05	0.09
2001	11	439	0.02	0.02	0.05	0.07	0.03	0.05
2002	13	777	0.03	0.04	0.06	0.09	0.04	0.07
Including the USSR up to 1992 and the Commonwealth of Independent States thereafter.								
1986	24	641	0.04	0.07	na	na	na	na
1987	25	900	0.06	0.09	na	na	na	na
1988	29	742	0.04	0.07	na	na	na	na
1989	29	879	0.05	0.08	na	na	na	na
1990	27	544	0.03	0.05	na	na	na	na
1991	29	638	0.03	0.06	na	na	na	na
1992	28	1 070	0.06	0.09	na	na	na	na
1993	33	864	0.04	0.07	0.20	0.32	0.12	0.21
1994	27	1 170	0.05	0.09	0.15	0.25	0.10	0.16
1995	25	711	0.03	0.05	0.13	0.21	0.08	0.14
1996	24	1 146	0.05	0.07	0.12	0.19	0.08	0.13
1997	25	921	0.04	0.06	0.12	0.19	0.07	0.13
1998	20	904	0.03	0.05	0.09	0.15	0.06	0.10
1999	21	499	0.02	0.03	0.09	0.15	0.06	0.10
2000	18	757	0.03	0.04	0.07	0.12	0.05	0.09
2001	13	577	0.02	0.03	0.05	0.09	0.03	0.06
2002	14	791	0.03	0.04	0.06	0.09	0.04	0.07

na not available

Source: ICAO accident/incident report programme (ADREP) and ICAO Air Transport Reporting Form A (Traffic).

Table A2-4. Aviation security (1983-2002)[1]

Year	Number of acts of unlawful interference	Number of acts of unlawful seizure		Number of acts of sabotage	Other acts[1]	Number of persons injured or killed during acts of unlawful interference	
		Attempted seizures	Actual seizures			Injured	Killed
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	7
1992	10	2	6	0	2	123	9
1993	48	8	29	0	11	38	112
1994	43	5	22	2	14	57	51
1995	17	3	9	0	5	5	2
1996	22	3	12	0	7	159	134
1997	15	5	6	1	3	2	4
1998	17	2	11	0	4	1	41
1999	14	1	12	0	1	3	4
2000	30	8	12	0	10	50	58
2001[3]	22	2	7	1	12	3 205	3 525
2002	22	6	2	2	12	14	186

1. This database is being reviewed and updated according to additional reports received from various sources to ensure consistency. For the new updates, please check the ICAO Web site (www.icao.int) and choose the link on aviation security.
2. Includes missile and facility attacks.
3. Official reports on the events of 11 September 2001 in the United States did not include the number of deaths and injuries on the ground. Therefore, estimated totals were taken from media sources.

— 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 studies on trends in the air transport industry at a global and regional level and specialized studies of a worldwide nature;

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

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

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