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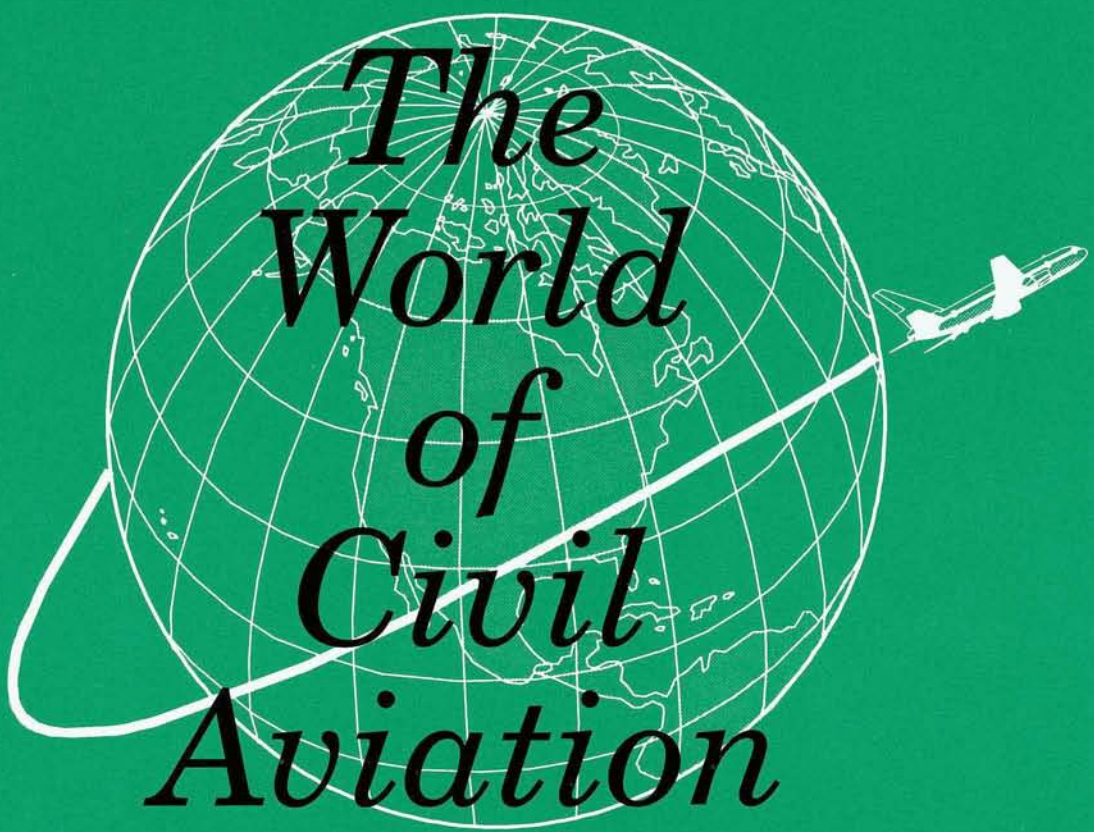

The World of Civil Aviation

2001–2004

Approved by the Secretary General and published under his authority

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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1/02

HIGHLIGHTS

DURING 2001 ...

The world economy weakened ...

The world's Gross Domestic Product grew by an estimated 2.5 per cent in real terms. On a regional basis the change in GDP ranged from an estimated increase of some 4.5 per cent for the Middle East to about 0.7 per cent for Latin America and the Caribbean (Chapters 1, 5 and 6).

... as airline traffic declined markedly,

Total scheduled passenger/freight/mail tonne-kilometres performed declined by 2.9 per cent due both to the economic slowdown and in particular to the events of 11 September. There were significant differences in the traffic growth between regions, ranging from 3.2 per cent for carriers based in the Middle East to –5.7 per cent for those in North America in terms of passenger-kilometres performed (Chapters 2, 5 and 6).

... airline operating results suffered ...

Preliminary estimates indicate that the world's scheduled airlines suffered an aggregate operating loss of 3.6 per cent of their total operating revenues, compared to an operating profit of 3.3 per cent in 2000 (Chapters 2 and 5).

... and many aircraft orders were stalled.

A total of 990 turbojet-powered aircraft were ordered compared to 1 553 in 2000. The financial commitment for orders placed for these aircraft with the major aircraft manufacturers is estimated to be about U.S.$69 billion, down from $80 billion the previous year (Chapter 2).

Bilateral and regional developments supported liberalization of air transport services ...

A significant number of bilateral agreements containing measures for liberalization of air transport services were concluded or amended between States. Regional and subregional civil aviation bodies in Africa, Asia/Pacific, Europe and Latin America considered or agreed upon gradual liberalization of intra-regional air services (Chapter 2).

...while a review of the Air Transport Annex to the GATS continued.

The World Trade Organization resumed its mandatory review of the Air Transport Annex to the General Agreement on Trade in Services and adopted guidelines, procedures and a work programme for negotiations on trade in services (Chapter 2).

Privatization of airlines continued and airline alliances expanded.

Privatization developments included: four airlines achieving their goals, another four airlines announcing their objectives and some 40 government-owned carriers continuing preparations. Airlines continued to expand transnational alliances, with most agreements including codesharing as one of the collaborative elements (Chapter 2).

More autonomy was given to infrastructure providers ...

The year witnessed further activity at the government level towards establishing autonomous entities to operate airports or to provide air navigation services, with growing emphasis being placed on active private participation in airport operations, management and finances. The trend towards cooperative strategies or alliances among airports prevailed (Chapter 3).

... and airport construction continued.

Europe, Asia and North America led the way in new airport projects completed, under construction or projected. Major airport expansion projects were under way in all regions (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 services 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 shows 13 aircraft accidents in 2001 involving 577 passenger fatalities compared to 18 accidents involving 757 passenger fatalities in 2000. The number of passenger fatalities per 100 million passenger-kilometres decreased from 0.025 in 2000 to 0.02 in 2001. By year-end, aviation administrations in 178 ICAO Contracting States and five territories had been assessed through the ICAO Universal Safety Oversight Audit Programme (Chapter 4).

... and there was greatly increased focus on security.

Twenty-one acts of unlawful interference were recorded in 2001, notably four simultaneous hijackings committed in the United States on 11 September using civil aircraft as weapons of destruction. Later in the same month, the ICAO Assembly took steps aimed at intensification of security measures worldwide (Chapter 4).

More stringent standards for aircraft engine noise were adopted ...

The ICAO Council adopted a more stringent noise standard than that in ICAO Annex 16, Volume I, Chapter 3, for jet-powered and large propeller-driven aircraft (Chapter 4).

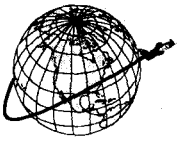
... and a comprehensive global policy on environmental protection was adopted.

The ICAO Assembly adopted a comprehensive policy including application of a "balanced approach" to aircraft noise management, local noise-related operating restrictions at airports, land-use planning and management, the environmental impact of civil aviation on the atmosphere and market-based measures regarding aircraft engine emissions (Chapter 4).

BETWEEN 2002 AND 2004

Recovery of airline traffic growth is expected, with a time lag ...

The growth of total scheduled passenger traffic (in terms of passenger-kilometres performed) is forecast to stabilize in 2002 at "zero growth" and to rebound at a 7.1 per cent rate in 2003 due mainly to an expected overall strengthening of the world economy, followed by 5.6 per cent traffic growth for 2004, back in line with long-term projections (Chapter 5).



... which will be longer in the case of airline finances.

The operating result — as a percentage of operating revenues (passengers, freight, mail and incidental revenues) — is forecast to remain negative at –3.2 per cent in 2002, then to improve progressively and to reach "break-even" by 2004 (Chapter 5).

Regional differences in traffic growth will persist.

Scheduled passenger traffic of airlines based in the Asia/Pacific region is expected to show the highest annual average growth rates, followed by Middle Eastern airlines. After a time lag of another year for recovery, European and North American airlines, servicing the world's most mature aviation markets, are projected to achieve strong growth rates for scheduled passenger traffic. Passenger traffic of African as well as Latin American and Caribbean airlines is forecast to recover sooner (Chapters 5 and 6).

Foreword

Introduction

1. This circular, *The World of Civil Aviation — 2001–2004,* is the tenth in an annual series of publications covering recent and future developments in civil aviation; the developments for the year 2000 were published in Circular 287. In the present circular, Part I reviews the main events in or affecting international civil aviation in 2001; Part II analyses trends in the world economy and the air transport industry and presents global forecasts of airline scheduled passenger traffic through to 2004; and Part III reviews, on a region-by-region basis, the year 2001 and gives prospects through to 2004.

2. The medium-term forecasts in *The World of Civil Aviation* are complemented by long-term forecasts, the most recent ones cover 2000 to 2010 and have been published as Circular 281, *Outlook for Air Transport to the Year 2010.*

Sources

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

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

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

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6. The statistical data for 2001 appearing in this circular are to be considered as preliminary: experience shows that the margin of error for world totals is probably less than two per cent, except in the case of operational results where it may be considerably higher. *Unless otherwise noted:*

a) all statistical data are applicable to ICAO Contracting States (187 at the end of 2001);

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; and

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

Monetary unit

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

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PART I

THE WORLD IN 2001

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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 air transport and tourism industries are very sensitive to safety and security concerns.

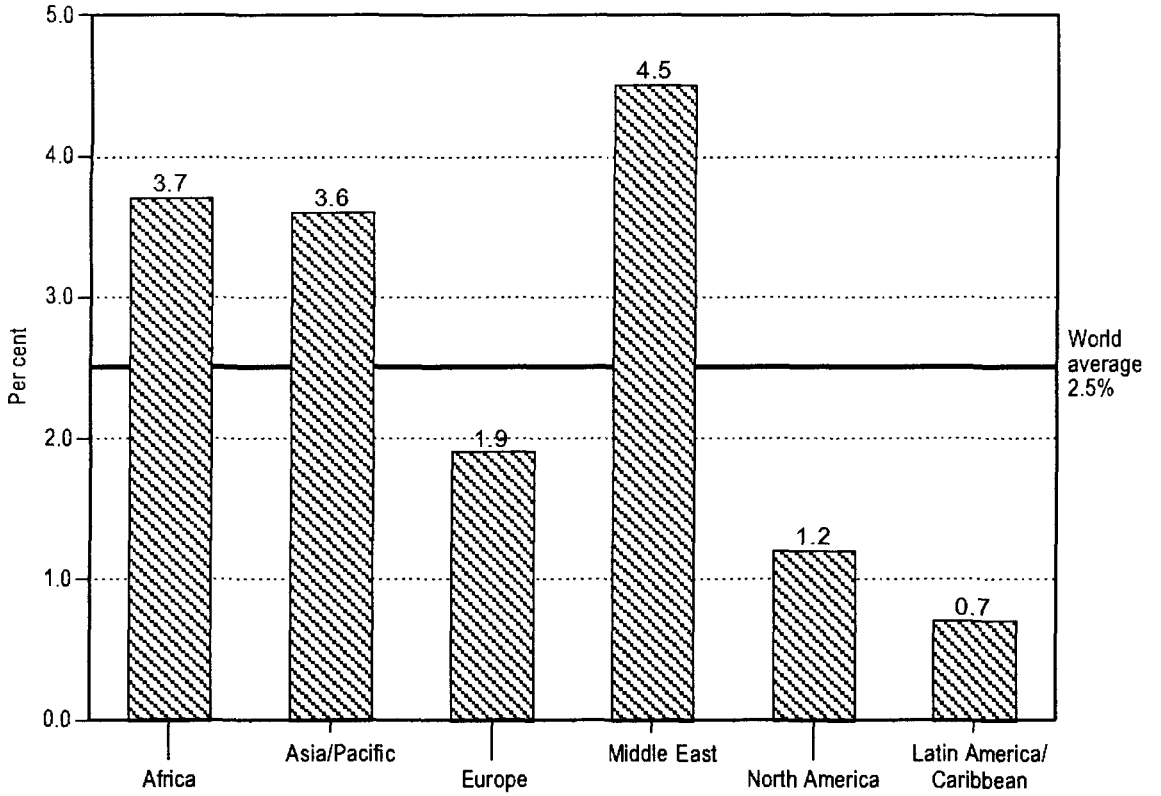
1.2 The world economy in 2001 underwent a sharp slowdown in growth with almost all regions softening in economic strength, following strong growth in 2000. This slowdown reflected weakening domestic demand and consumer confidence, particularly in North America. Europe saw its economic growth reduced to half the 2000 level while Latin America and the Caribbean lost most of the recovery gained the previous year. Asia and the Pacific and the Middle East also lost some growth momentum, although to a lesser extent. Africa's economic performance remained stable.

1.3 As background to the analysis of the world of civil aviation in 2001, which follows in Chapters 2 to 4, this chapter reviews global developments in 2001 concerning: economic output, international trade and tourism, inflation, interest rates, 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 2004 (Chapter 5), and Part III, Regional Perspectives 2001–2004 (Chapter 6), respectively.

GROSS DOMESTIC PRODUCT

1.4 Global Gross Domestic Product (GDP) grew by an estimated 2.5 per cent (in real terms), compared to 4.6 per cent in 2000. 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 2001.

1.5 The economies of industrialized countries expanded merely at an estimated 1.2 per cent GDP growth rate in 2001, almost 3 percentage points lower than the previous year. Since industrialized countries produce more than half of the global output, their performance had an overall dampening effect on the world economy. The economic slowdown in North America



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 (2001/2000)

(1.2 per cent GDP growth) resulted from weakening domestic demand and consumer confidence, further exacerbated by the events of 11 September, which were a notable destabilizing factor.

1.6 The European region achieved an average GDP growth of 1.9 per cent in 2001, to which the European Community (EC), formerly called the European Union, contributed at an almost similar rate (1.7 per cent). The economies of Central and Eastern European countries grew in the aggregate around 3.0 per cent and most countries of the Commonwealth of Independent States (CIS) showed a steady economic recovery, averaging about 6.2 per cent GDP growth.

1.7 The economic performances of developing countries in 2001 averaged about 4.0 per cent GDP growth compared to 5.6 per cent in 2000. Africa's economic performance remained stable with a GDP growth of 3.7 per cent. The regional economy with the largest share in the world economy, Asia and the Pacific, was impacted by weakening demand from some major trading partners, but its GDP still grew at 3.6 per cent, above the world average. The

developing economies of Asia/Pacific contributed significantly as their aggregate GDP grew by 5.6 per cent, but this result masks vast differences between countries. China's GDP growth of 7.3 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 (NIEs) experienced a sharp slowdown, averaging 0.8 per cent GDP growth, following their strong growth of 8.0 per cent in 2000. Japan's GDP contracted by almost 0.4 per cent during 2001. The Australian and New Zealand economies grew at around 2.4 per cent, similar to the world average.

1.8 In other regions, adverse factors also caused a reversal of the recovery momentum of the previous year and led to an economic slowdown. The region of Latin America and the Caribbean was affected by both the slow growth in the global economy and a financial crisis in Argentina. As a result, the region's GDP growth slowed from 4.3 per cent in 2000 to 0.7 per cent in 2001. Linked to the fall in oil prices, the Middle East region's economy grew by about 4.5 per cent, compared to 6.4 per cent reported the previous year.

INTERNATIONAL TRADE AND TOURISM

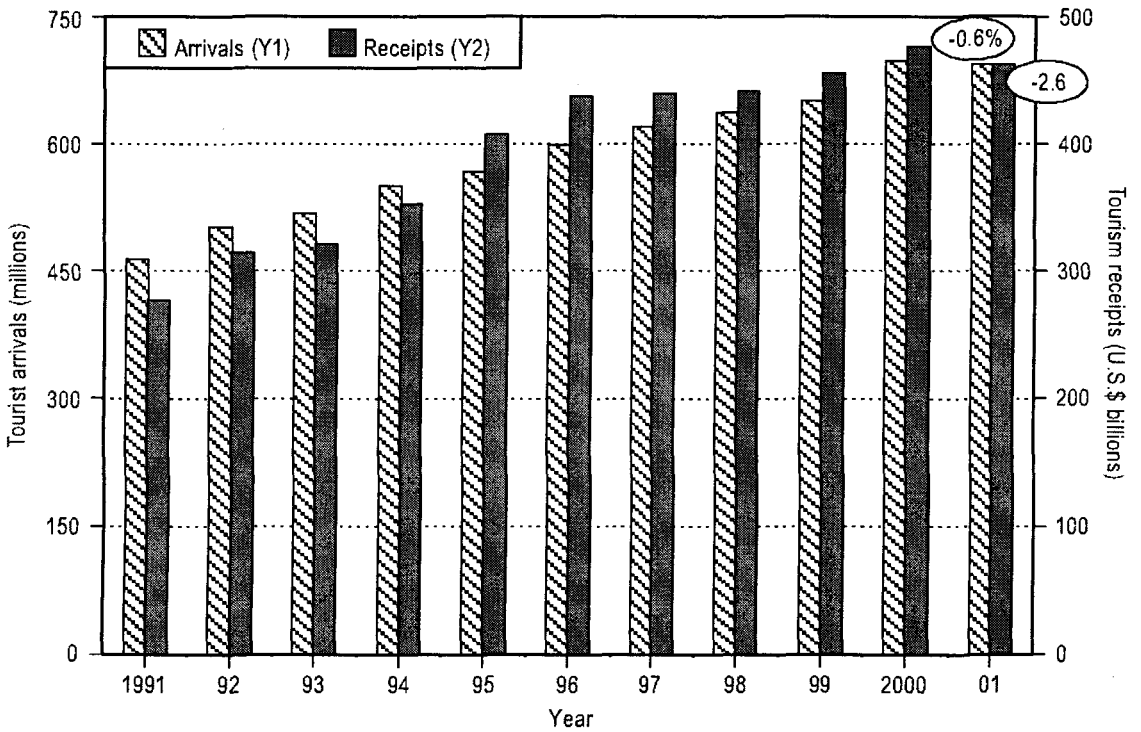
1.9 The economic slowdown in 2001 had a negative impact on world trade developments. In 2000, worldwide growth of trade in goods and services is estimated to have grown a mere 1 per cent compared to 12.4 per cent in 2000 (which was the highest rate achieved during the last decade). Industrialized economies were severely affected as both their export and import volumes declined by 0.3 per cent, following a strong 11.5 per cent increase the previous year. Growth in export and import volumes of developing countries contracted from 15 and 16.1 per cent respectively in 2000 to 3.4 and 5 per cent respectively in 2001.

1.10 Although internationally marketed services benefited from globalization of economic activities and have gained importance in recent years, trading of goods still commanded an 80 per cent share of the value of world exports, amounting to $6 064 billion in 2000, according to the IMF. Trading of goods stagnated in 2001; world exports and imports grew marginally in volume (0.2 per cent), representing a significant decline from a high 12.8 per cent growth rate in 2000. Trading of manufactured goods contracted by 0.2 per cent compared to a buoyant 14.2 per cent growth in 2000. Industrialized economies suffered a 1.0 per cent decline for both exports and imports while developing countries experienced deteriorating growth rates at 2.3 per cent for exports and 3.5 per cent for imports.

1.11 Demand for international air travel is significantly fuelled by international tourism. According to WTO-OMT statistics, a world total of 693 million international tourist arrivals were reported in 2001, representing a decline of 0.6 per cent. Two factors combined to have caused this decline: the global economic slowdown and the drastic slump in air travel, accelerated by a temporarily shattered consumer confidence following the 11 September events in the U.S. As a result of four million fewer international tourists, foreign exchange earned in host countries in terms of international tourist receipts slumped to $462 billion in 2001, a decline of 2.0 per cent from $474 billion in 2000. Figure 1-2 provides global results in tourist arrivals and receipts from 1990 to 2001.

1.12 Looking at the regional tourism developments presented in Table 1-1, Europe still attracted 400.3 million international tourists, the highest number of arrivals compared to other regions of the world, and $230.1 billion in tourism receipts, about half of the world total of $462.2 billion. However, international arrivals in Europe declined by 0.6 per cent and receipts by 1.2 per cent in 2001. International arrivals in countries of the Americas fell by 5.9 per cent on average, mirroring economic problems in Brazil, Argentina and Japan that started well before 11 September, as well as decreasing levels of consumer confidence of travellers to and from the U.S. Inbound and outbound tourism to the U.S. suffered in the aftermath of the attacks; arrivals for 2001 fell by almost 10.6 per cent while tourism destinations dependent on U.S. tourists also suffered from loss of business, notably Mexico (–4 per cent), Caribbean countries (–3 per cent) and, least affected, Canada (–0.1 per cent).

1.13 International arrivals to countries of South Asia dropped on average by 6.3 per cent. The proximity of military operations in Afghanistan resulted in a 25 per cent drop in international arrivals to the region during the September to December period 2001. Elsewhere, civil unrest also had a negative impact on tourism (Nepal: –22 per cent and Sri



Source: WTO-OMT.

Figure 1-2. International tourist arrivals and receipts — World (1991-2001)

Table 1-1. Regional distribution of international tourist arrivals and receipts — 2001

	Total arrivals[1] (millions)	Change 2001/2000 (%)	Total receipts (U.S.$ billions)	Change 2001/2000 (%)
Africa	28.2	3.8	11.7	7.3
Americas	120.8	-5.9	122.4	-7.8
East Asia/Pacific	115.1	5.5	82.0	0.7
Europe	400.3	-0.6	230.1	-1.2
Middle East	22.5	-3.1	11.2	-2.6
South Asia	5.7	-6.3	4.7	-4.1
World	692.7	-0.6	462.2	-2.6

1. Estimate as per data collected by WTO, June 2002.

Source: WTO-OMT.

Lanka: –16 per cent). There were still 5.5 per cent more international tourists travelling to East Asia and the Pacific but the pre-September growth rate was about twice as high. Economic problems in Japan, which accounts for 17 per cent of that region's tourism, also slowed down tourism business in recipient countries as outbound tourism declined by an estimated 4 to 6 per cent.

1.14 The Middle East also felt the negative impacts of safety and security concerns on tourism in their region which saw 3.1 per cent less tourists arriving. Africa's international arrivals grew by 3.8 per cent mainly due to a strong performance of North African countries which was, however, also dampened during the last quarter of 2001.

INFLATION, INTEREST RATES 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 2001, inflation in most industrial countries increased moderately, resulting in an aggregate rate of 2.3 per cent for consumer prices, unchanged over the previous year. In the context of an economic slowdown in the U.S., consumer prices increased by 2.9 per cent in 2001, compared to 3.4 per cent in 2000. In a climate of low domestic demand, Japan's consumers experienced declining prices for the third consecutive year, 0.8 per cent in 2001.

1.16 Consumer prices in developing countries as a group followed a similar trend as inflation rates in previous years with an average rate of 6.0 per cent in 2001. Large variations prevailed from region to region and among countries within regional groupings. Developing countries in Asia managed to keep consumer prices at low levels as reflected in the regional rate of increase of 2.8 per cent in 2001. In Africa, inflation continued to stabilize, albeit with prices rising still at an aggregate rate of 12.8 per cent in 2001. In South America and the Caribbean, consumer prices stabilized below 10 per cent for the fourth consecutive year (6.3 per cent in 2001). In the Middle East region, consumer prices were kept below the 20 per cent mark for the second consecutive year in the last decade. For "countries-in-transition" from centrally planned to market-based economies, the aggregate inflation rate continued to drop in 2001, to 16 per cent. Similarly, the Russian Federation experienced price stabilization with an increase around 20 per cent in 2001. Central and Eastern European countries (excluding the CIS) continued to control the rise of their consumer prices and saw a 9.3 per cent increase in 2001.

1.17 Currency exchange rates responded to the international differences in asset values, interest and inflation rates, trade balances and various speculative pressures in individual countries. Among the currencies of major industrial countries, the Japanese yen weakened significantly against the U.S. dollar in 2001. Depreciation of a number of Asian currencies in recent years contributed to a general strengthening of the U.S. dollar. At the same time, the common unit of the European exchange rate mechanism, now called the EURO, maintained an average at almost the same level against the U.S. dollar as achieved in the previous year, closely followed by the pound, United Kingdom (U.K.), which depreciated moderately against the U.S. dollar (Figure 1-3).

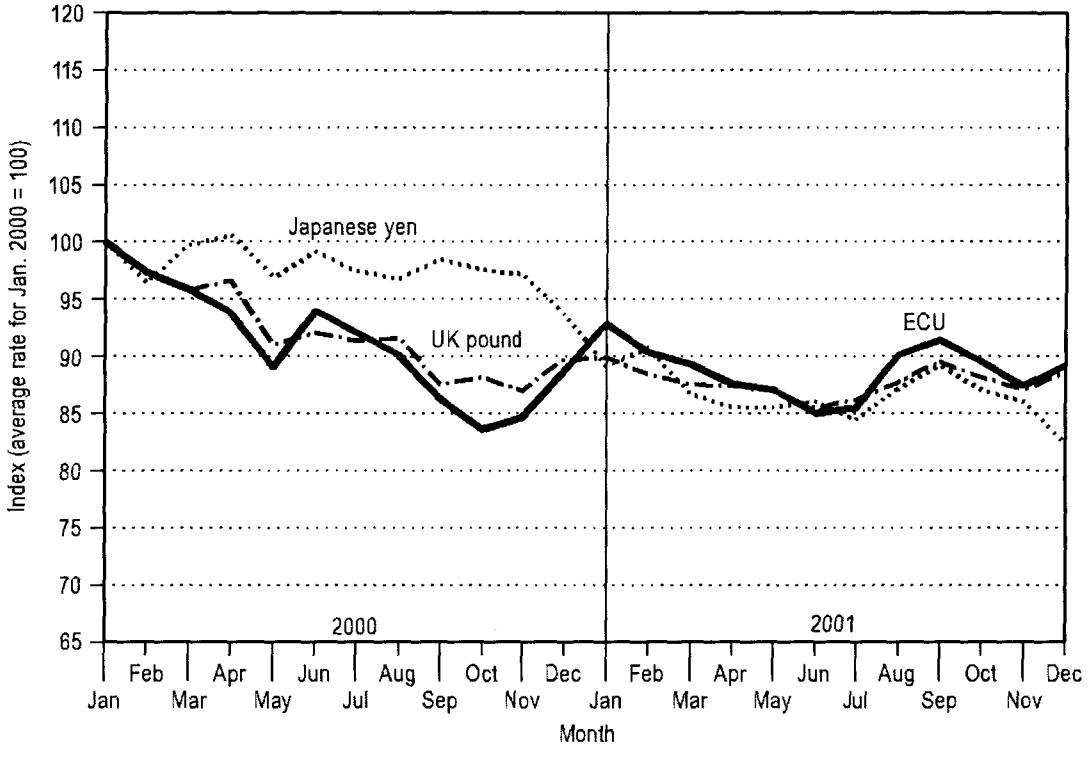
1.18 Movements in exchange rates affect relative prices of international travel markets and hence the related demand and subsequent geographical distribution of traffic flows. Travel decisions are affected by exchange rates and price comparisons at different destinations. Differences in inflation rates 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 sheets of airlines. For instance, devaluation of a given national currency, and consequently weakened exchange rate, tends to reduce the operating profit of that country's airlines if those carriers accrue higher expenses than they generate revenues in internationally convertible foreign currencies. On the other hand, the debit of an airline lessens if the foreign currency in which it is incurred depreciates, whereas a debt burden increases if that currency appreciates.

CRUDE OIL AND JET FUEL

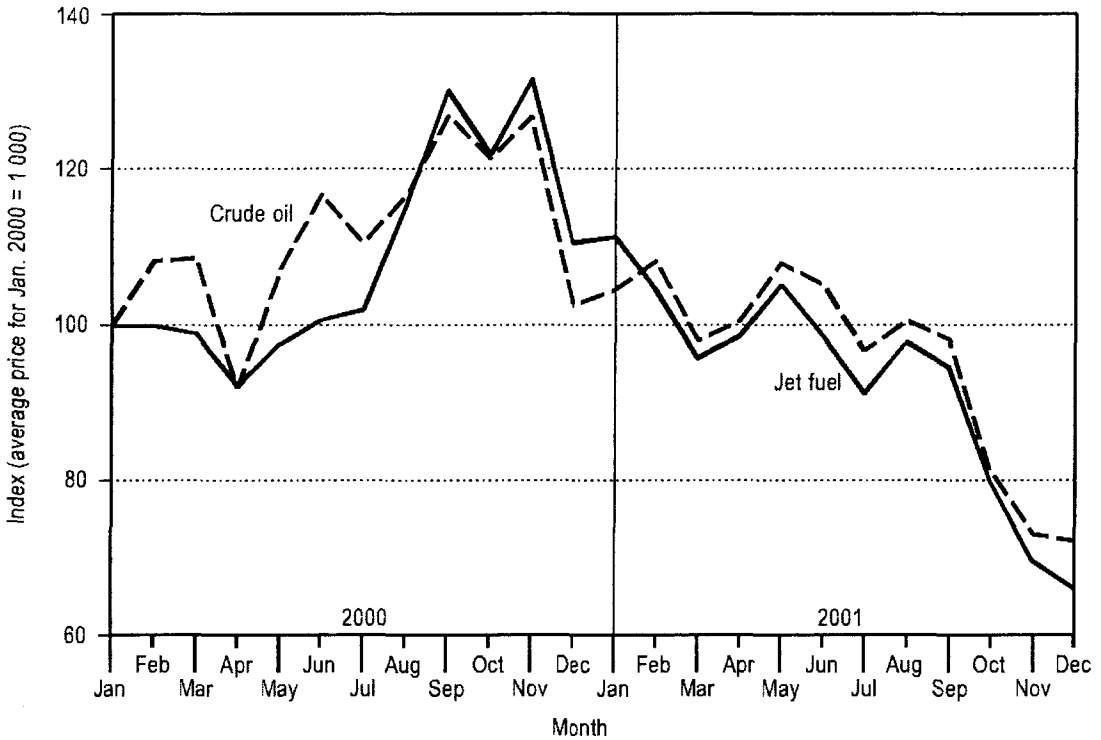
1.20 In the year 2001, world prices of crude oil softened due to a contraction in demand following an exceptionally strong performance in most oil exporting countries in 2000. Following falling production and price levels during the first half of 2001, the world trade prices of crude oil plummeted after 11 September (Figure 1-4). After oil prices had soared to as high as $33 per barrel towards the end of 2000, they fell to as low as $19 during the last quarter of 2001.

1.21 Consequently, jet fuel prices fell significantly, easing the pressure of operating costs of airlines worldwide. 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, still almost a third more than the 1999 price level. Over the past decade, fuel costs have ranged from 12 to 25 per cent of scheduled airlines' operating costs.



Source: IATA five-day rate.

Figure 1-3. Currency variations with respect to the U.S. dollar (January 2000 to December 2001)



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

Figure 1-4. Trends in crude oil and jet fuel prices (January 2000 to December 2001)

Chapter 2
Air Carriers and their Fleets

2.1 This chapter reviews developments in 2001 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

Air transport agreements and negotiations

2.2 Bilateral air services agreements are still the prevailing approach taken by States when expanding international air transport services. During the year, a total of 80 bilateral air services agreements were reportedly concluded or amended by 65 States. Of the 65 States, Canada, Chile, Germany, Hong Kong Special Administrative Region (SAR) of China, India, Japan, New Zealand and the United States each concluded or amended 5 or more agreements.

2.3 Continuing a trend, over 70 per cent of these agreements and amendments contained some form of liberalized regulatory arrangements. For example, 6 "open skies" agreements were concluded among 8 countries; these agreements provide for full market access without restrictions on designations, route rights, capacity, frequencies, codesharing and tariffs. About 85 "open skies" bilateral agreements have been concluded since 1992, involving approximately 70 countries, with the United States being one of the partners in two-thirds of the cases (see Table A1-1 of Appendix 1). These agreements involve not only developed countries but also an increasing number of developing countries (about 60 per cent).

2.4 Some bilateral negotiations, however, have not been easy. For instance, six-year-long "open skies" negotiations between the U.S. and the U.K. were deferred until early 2002, taking into consideration the U.S. DOT's review of the proposed transatlantic alliance between American Airlines and British Airways. The United States continued bilateral negotiations also with Hong Kong SAR of China, Japan, the Philippines and South Africa respectively, but could not reach a consensus because these countries aim at gradual liberalization rather than a full commitment to "open skies".

Regional and national regulatory developments

2.5 Some agreements negotiated in recent years have sought to liberalize air transport services on a regional basis or among a group of like-minded States. The 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. In 2001 there were at least 11 such regional or plurilateral arrangements with several potential arrangements in the pipeline.

2.6 Major developments were reported in the following regions. In Africa, the Economic and Monetary Community of Central Africa and the Economic Community of West African States agreed in March to move forward with the liberalization of air transport in the two regions, with the aim of achieving full implementation by June 2004. In Asia and the Pacific, a plurilateral "open skies" agreement ("Kona" agreement) between five like-minded members of the Asia-Pacific Economic Cooperation (APEC) (Brunei, Chile, New Zealand, Singapore and the United States) was signed in May and entered into force in December. In Europe, all 15 Member States of the European Community (EC) ratified wide-ranging bilateral agreements with Switzerland, which fully integrate the country into the European Economic Area (EEA). In Latin America, the six States that are parties to the Fortaleza Agreement (signed in 1997) met in March to discuss ways of progressing their liberalization initiatives. They agreed to a two-year plan for phased liberalization of market access, capacity and frequency terms among Member States. In the Middle East, the Arab Civil Aviation Commission (ACAC) discussed in April a Draft Agreement on the Liberalization of the Exchange of Traffic Rights, proposing a phased approach ultimately leading to the full liberalization of traffic rights among Member States.

Trade in services developments

2.7 At the national level, the Governments of Canada, Kenya, the Philippines and South Africa initiated a review process of their overall air transport policy in light of the global trend toward increased liberalization. Several other States also took steps toward liberalization. For example, in August, the Government of Bangladesh decided to allow private carriers to operate in certain international markets. Also in August, the Government of Brazil removed price controls on all domestic routes following the deregulation of domestic fares on major routes in April. In March, the Government of Cyprus embarked on liberalization of its regulation on air carrier licensing. In September, the Government of Ecuador authorized increased access to the country's airports and removed price controls on air cargo. In April, the Government of Poland announced that, effective 1 January 2004, it would open its air transport market completely.

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 computer reservation system services.

2.9 In 2001, the WTO-OMC resumed its mandated review of the Air Transport Annex and adopted the guidelines, procedures and work programme for the negotiations on services. Proposals on air transport services submitted to the Council on Trade in Services (CTS), which oversees the application of the GATS, covered multilateralization of the first and second freedoms of the air; ground handling services; airport management services; leasing or rental services of aircraft without operator; and services auxiliary to all modes of transport when delivered in an air transport context. At a meeting of the CTS in October, the continued exclusion of traffic rights from coverage by the Air Transport Annex was strongly supported. However, CTS did not arrive at any firm conclusion and will continue its review in 2002. At the fourth Ministerial Conference of the WTO-OMC, held in Doha, Qatar, in November, objectives and timetables for the negotiations initiated in January 2000 were deliberated with a view to promoting the economic growth of all trading partners, particularly developing and least-developed countries. It was decided that Members shall submit initial requests for specific commitments by 30 June 2002 and initial offers by 31 March 2003.

2.10 A related development was WTO-OMC's consideration of a proposed GATS Annex on Tourism Services. Tentative drafts of this Annex include elements that have implications for air transport, such as perceived anti-competitive practices, including access to airports and to computer reservation systems services. In 2001, concerns persisted that these elements may conflict or overlap with those contained in the the Air Transport Annex. Particular concern was caused by a new proposal that envisages access to air transport infrastructure and related services on a non-discriminatory basis which was presented by nine Members of the CTS. Separately, the OECD carried on its work on the liberalization of air cargo transport by developing a draft bilateral protocol and a model multilateral agreement.

2.11 In February, ICAO made a proposal to the WTO-OMC to develop a Memorandum of Understanding (MoU) between the two organizations to strengthen cooperation and to recognize the respective roles within the mandates of each organization. Although the idea was supported in principle, in view of the lack of consensus, the subject was retained as a standing item on the agenda for subsequent meetings.

Fair competition

2.12 Anti-competitive behaviour in the airline industry may take a variety of forms, which can range from predatory practices against a specific competitor on a particular route to monopolistic activities serving to strengthen existing market power. Along with liberalization, the question of how to maintain fair competition in international air transport is increasingly becoming an issue. The more frequent use of competition laws in dealing with anti-competitive behaviour is one indication. Table A1-2 summarizes major anti-competitive cases reported in 2001, except those involving mergers, alliances and State aids.

2.13 One of the fundamental problems in dealing with anti-competitive behaviour is how to distinguish between unfair and normal competitive behaviours. In January, the U.S. DOT announced that it would not publish competition guidelines, as originally proposed in April 1998, to address unfair competitive practices against new airlines; instead, it would publish analyses and develop standards using a case-by-case approach. In May, a federal

judge dismissed an antitrust lawsuit filed by the U.S. Department of Justice (DOJ) in May 1999 against American Airlines' alleged predatory activity. The DOJ decided to appeal the case in June.

State aid

2.14 The issue of State aid re-emerged as a number of States took action in response to the financial difficulties in the airline industry, owing to the economic slowdown and the impact of the events of 11 September in the United States. Following the events of 11 September, a number of countries provided direct or indirect financial assistance to their air transport industries. Financial aid included not only monetary disbursements to compensate air carriers, service providers and some ancillary services for the losses incurred owing to the closure of airports and airspace, but also indirect support in terms of loan guarantees, liability protection and insurance coverage, restructuring of loans at low interest rates, optimization of taxation, extension of unemployment and health insurance coverage, grants for retraining, bridging loans to avoid immediate collapse, etc. A number of governments also took measures to indemnify their carriers against the risks left open as a result of action taken by the insurance industry. Following the events of 11 September and after a seven-day notice, underwriters cancelled 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) globally effective 24 September 2001.

2.15 The EC Council agreed in September that Member States may cover insurance premiums linked to acts of war and terrorism or grant State guarantees to cover such risks on certain conditions. Initially, this measure was allowed for a one-month period, but was subsequently extended twice until 31 March 2002. In October, the European Commission allowed Member States to grant compensation to airlines for costs incurred due to the closure of U.S. airports and airspace. In the same month, the Commission approved the Belgian Government's bridge loan of Euro 125 million granted to Sabena under Community rules on rescue and restructuring aid. Following Sabena's bankruptcy and liquidation in November, this bridge loan was transferred to Sabena's subsidiary, Delta Air Transport. The Commission also approved the aid for Alitalia and the German charter carrier LTU, but expressed concern about the incompatibility of the aid to Swissair with the competition rules laid down in the EC–Switzerland bilateral agreement. When Swissair was threatened with bankruptcy in October, the Government of Switzerland provided Swiss Franc (SF) 450 million and subsequently an additional SF 1 billion in loans to keep the carrier flying; it later agreed to invest SF 600 million in a new national airline.

2.16 Immediately after 11 September, the U.S. Congress passed the Air Transportation Safety and System Stabilization Act, which provides a $15 billion emergency aid package for U.S. airlines comprising $5 billion ($4.5 billion for passenger airlines, $500 million for cargo-only carriers) in direct compensation for the losses incurred due to the tragic events and $10 billion in federal loan guarantees, as well as liability protection for American Airlines and United Airlines. In November, America West Airlines and Vanguard Airlines each submitted an application for federal loan guarantee assistance under the Act (see also the section on Liability in Chapter 4).

Consumer protection

2.17 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, ban 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, 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.

2.18 In Europe, after extensive consultations of a special Task Force under the joint moderatorship of the European Commission and the European Civil Aviation Conference (ECAC), European airlines and airports developed the Airline Passenger Service Commitment and the Airport Voluntary Commitment on Air Passenger Service. In May, these two voluntary codes were unveiled at the EC-ECAC Dialogue on Passenger Rights with intended effectiveness from February 2002. In December, the Commission proposed replacing the existing regulation in order to protect and strengthen the rights of air passengers when facing denied boarding, cancellation of their flight or a long delay.

2.19 In the United States, the Inspector General of DOT released in February the final report of an exhaustive audit of the Airline Customer Service Commitment being developed by the ATA since 1999. The report reviewed the fulfilment of the Commitment and noted that while airlines were making efforts to improve customer service in many categories, consumer dissatisfaction continued to increase in some areas, particularly concerning flight delays and cancellations. In response to the report, ATA and its member airlines agreed to additional efforts recommended by the report, and in June announced that each carrier incorporated the Commitment into its contract of carriage, thus making it legally enforceable by a customer against an airline.

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 According to the AEA, delays of intra-European departures exceeding 15 minutes showed minor improvements affecting 24.2 per cent of departures, down from 30.3 per cent in 1999 but almost level with 25.5 per cent in 2000. The highest proportion of delays was

attributed to the constraints of air traffic control and airport congestion. In June, after two reports and extensive consultations with stakeholders, the European Commission issued a proposal to amend its 1993 regulation on the common rules for the allocation of slots at Community airports. In the first instance, the proposed revision focuses on improving its application without fundamental change to the current system which evolved like an inherited right to slots. The more radical proposals will be considered in the subsequent stage, following in-depth study and consultation with the industry and Member States. In October, the Commission permitted airlines to keep unused slots with "grandfather status" during the summer season of 2002 to deal with the situation created by the events of 11 September.

2.22 In the United States, the delay problem has been temporarily reduced since 11 September because of the downturn in air traffic. According to an ATA study, however, delays cost the United States an estimated $3.2 billion in lost productive time. Direct costs to the airline industry totalled an additional estimated $3.2 billion. In June, the U.S. Federal Aviation Administration (FAA) sought public comment on longer-term mechanisms for managing demand at New York's LaGuardia Airport. The mechanisms include two market-based solutions proposed by the Port Authority of New York and New Jersey as the airport proprietor, namely a congestion fee and a slot auction. In August, the FAA also conducted a second mini-lottery to allocate 21 unused slot exemptions that had become available at LaGuardia Airport since the FAA's initial slot lottery plan went into effect on 31 January.

OWNERSHIP, ALLIANCES AND COOPERATION

Privatization

2.23 The motives for privatization of government-owned airlines have been highly diverse, ranging from purely economic considerations to improve operating efficiency and competitiveness to a more pragmatic desire to reduce the heavy burden of financing capital investment in new equipment. Whatever the reasons, privatization has been one of the pre-eminent phenomena throughout the world. Since 1985, about 130 governments have announced privatization plans or intentions concerning approximately 180 national airlines. During this period, 85 of these targeted carriers have achieved their privatization goals, and 20 of them have been fully privatized.

2.24 In 2001, the trend towards partial or full privatization of government-owned airlines continued but at a slower speed. Only four carriers achieved their privatization aims, namely Aerolineas Argentinas, Air Burkina, Air Ivoire and Iberia (see Table 2-1). The Government of Burkina Faso reduced its stake in Air Burkina from 66 per cent to 14 per cent in January by transferring control of the carrier to Aga Khan's Industrial Promotion Services. In October, the Government of Côte d'Ivoire sold its remaining 51 per cent stake in Air Ivoire to All Africa Airways, a company in which Air France has a 51 per cent stake. The Spanish state holding company, SEPI, reduced its stake in Iberia from 53.9 per cent to 5.39 per cent as a result of the initial public offering in April. In October, SEPI also sold its entire 92 per cent stake in debt-ridden Aerolineas Argentinas to the Spanish-Argentinean group, Air Comet, while the Government of Argentina divested its 5 per cent stake in the carrier.

Table 2-1. Government-owned airlines targeted for partial or full privatization — 2001

Announced during 2001	Announced before 2001 and progress reported	Aim achieved during 2001
Atlantic Airways Faroe Islands	Aer Lingus (delayed)	Aerolineas Argentinas
Azerbaijan Airlines	Aeromexico/CINTRA (delayed)	Air Burkina
Corse Mediterranee (CCM Airlines)	Air Afrique	Air Ivoire
Crimea Air KRYM	Air Algerie	Iberia
Kharkiv Airlines (Ukraine)	Air Botswana	
Lugansk Aviation Enterprise (Ukraine)	Air China	
Merpati Nusantara Airlines	Air India (delayed)	
Odessa Airlines (Ukraine)	Air Ivoire	
Polynesian Airlines	Air Niugini (delayed)	
Slovak Airlines	Air Tchad	
Syrianair	Biman Bangladesh	
	El Al Israel Airlines	
	Garuda	
	Indian Airlines (delayed)	
	Lithuanian Airlines	
	LOT Polish Airlines (delayed)	
	Malev (delayed)	
	MEA Middle East Airlines	
	Mexicana/CINTRA (delayed)	
	Nigeria Airways (delayed)	
	Olympic Airways (delayed)	
	Pakistan Airlines	
	Royal Air Maroc (delayed)	
	South African Airways (delayed)	
	TAP Air Portugal	
	Thai Airways International (delayed)	
	Turkish Airlines (delayed)	

Source: Aviation press.

2.25 In addition, another 40 government-owned carriers were reported to be in various stages of preparation for partial or full privatization. In several cases, privatization plans were deferred or postponed because of the complexities encountered in the process or the economic condition of the airlines concerned or owing to other circumstances. For example, the Government of India received several offers for the partial privatization of Air India, but all the bidders pulled out from the tender process because of the difficulties for foreign airlines to form a consortium with local partners to meet the bidding conditions. The plan to sell a 51 per cent stake in Indian Airlines to non-airline investors was also postponed due to complex political considerations. Both attempted partial privatizations of Malev as well as Turkish Airlines were put on hold on account of lack of investor interest. The privatization of Olympic Airways attracted several investors, but none of the offers could meet the financial criteria set by the government. In the case of Thai Airways International, the plan to sell 23 per cent including a 10 per cent share to a foreign carrier has been suspended because of local opposition.

2.26 During the year, some governments raised their shareholdings in their national carriers to avoid their immediate collapse. The Government of New Zealand assumed an 82 per cent shareholding in Air New Zealand after a NZ$885 million rescue package had been unveiled in October. Air New Zealand, which faced financial problems due to the failure of its Australian subsidiary, Ansett, had been fully privatized in 1989, with the government keeping a major share. In September, Malaysia Airlines, in which the government and governmental agencies now own approximately a 70 per cent stake, issued redeemable convertible preference shares to Intelek Perkasa, a government-backed group, which could acquire a 27.9 per cent stake if the carrier does not redeem the preference shares within five years. The Government of Switzerland together with cantonal and municipal authorities acquired in total a 33.7 per cent stake in the new national airline that superseded Crossair. Public institutions, cantons and communes had held a total 12.5 per cent stake in the bankrupt Swissair. The Government of Poland increased its stake in LOT Polish Airlines from 52 per cent to 67.96 per cent by a $97 million capital injection and the resulting new shares issuance in December. The carrier had been partially privatized by selling a 37.6 per cent stake to Swissair in 1999 and a 10.4 per cent stake to LOT's employees in 2000.

National consolidation

2.27 Airlines in many parts of the world continued the pursuit of the perceived advantages of enhanced market strength through mergers, acquisitions or operational integration. 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 themselves against fierce competition, and increase the scale of operations in order to attain a critical market position. Although mergers or acquisitions are easier to achieve within the same country, a number of States expressed their concerns about proposed mergers which would reduce competition, and scrutinized them with great caution.

2.28 In the Asia and Pacific region, the Australian Competition and Consumer Commission (ACCC) authorized the proposed acquisition of Hazelton Airlines by Ansett in March and Impulse by Qantas in May after the carriers agreed to significant undertakings. Since Ansett's shutdown in September, Qantas' market share in the Australian domestic market has climbed to over 85 per cent. The Civil Aviation Administration of China (CAAC) finalized its consolidation plan in June, under which the ten former CAAC-affiliated airlines would be restructured into three groups headed by Air China, China Eastern Airlines and China Southern Airlines. In November, Japan's Fair Trading Committee started to review the proposed integration of Japan Airlines and Japan Air System under a jointly created holding company.

2.29 In Europe, major airlines launched takeovers of, mostly, smaller regional airlines. In Austria, Austrian Airlines acquired Rheintalflug and continued to increase its stake in Lauda Air from 54.6 per cent to 67 per cent. In April, Air France merged three subsidiary carriers, Flandore Airlines, Proteus Airlines and Regional Airlines, under the name of Regional Airlines Group. In Germany, Lufthansa acquired a 24.9 per cent stake (with an option to increase to 49 per cent) in Eurowings, which was approved with conditions by the German

Cartel Office in September. In Greece, two private carriers, Aegean Airlines and Cronus Airlines, merged in March. In Norway, the local competition authority approved SAS's takeover of Braathens in October. In Spain, merger talks between Iberia and Air Europa eventually fell through in January. In the Russian Federation, Sibir's takeover of Vnukovo Airlines was approved by the authorities in February. In the United Kingdom, British Airways acquired Regional Airlines Group in April, which was subsequently merged with Brymon Airways to form British Airways CitiExpress.

2.30 In the Americas, American Airlines' buyout of bankrupt TransWorld Airlines was approved by the U.S. circuit court in April. By contrast, United Airlines and US Airways formally abandoned their merger plan because of the DOJ's decision in July that it would take legal action to block their merger proposed in May 2000. In December, Aloha Airlines and Hawaiian Airlines announced their intention to merge, subject to state and federal approval. The Canadian Competition Bureau cleared Canada 3000's takeover of Royal Aviation in March and CanJet in May, respectively. However, Canada 3000 filed for bankruptcy in November, leaving over 80 per cent of the market to Air Canada. The proposed merger of Avianca and Aces was approved by the Colombian Civil Aviation Authority in December.

Transnational ownership

2.31 Equity investment in foreign carriers is often made as part of a strategy to forge or strengthen alliances and expand market access, though an equity stake is not a risk-free investment. The opportunity to take an equity stake in foreign airlines has increased as many States adopted a new policy or amended existing rules on foreign investment or control in national carriers and relaxed the air carrier ownership and control conditions in the bilateral air services agreements. At the end of 2001, over 60 carriers had shareholdings in foreign airlines while about 200 airlines had equity owned by foreign investors.

2.32 In 2001, LanChile and SAS were active players in acquiring stakes in foreign carriers. LanChile purchased a 25 per cent stake in MasAir of Mexico and U.S. cargo airline, Florida West International Airways, in January. It also purchased a 73.3 per cent stake (20 per cent voting, 100 per cent preferred shares) in Aerolineas Brasileiras S.A. of Brazil in December. SAS increased its share in Air Baltic from 34 per cent to 47.2 per cent in October. It also increased its existing 49 per cent shareholding in Spanair to a total of 74 per cent by adding a newly established holding company's stake. To avoid the risk of losing traffic rights outside the European Economic Area (EEA), Spanair's shareholders, Teinver and SAS, jointly set up a holding company (Teinver holds 51 per cent and SAS 49 per cent), which owns 51 per cent of Spanair.

2.33 By contrast, several airlines reduced their shareholdings in foreign carriers. For example, British Airways' original 25 per cent stake in Qantas was reduced to 21.4 per cent after its new equity placement in October. KLM divested its 30 per cent stake in Braathens, which was acquired by SAS. Lufthansa's stake in Air Dolomiti was reduced from 25 per cent to 20.69 per cent as a result of the initial public offering in June. Singapore Airlines' 25 per cent stake in Air New Zealand was cut to 4.3 per cent after the recapitalization by the government in October. Debt-ridden Swissair Group was forced to divest most of its foreign

investments. Swissair's 10 per cent stake in Austrian Airlines was transferred in May to Credit Suisse First Boston. Its French subsidiary, Air Littoral, was sold in June to a regional finance group led by Marc Dufour, while another French subsidiary, AOM-Air Liberté, was sold in July to the Holco group. Swissair also withdrew its commitments both to acquire a 34 per cent stake in TAP Air Portugal in February and to raise its stake from 49.5 per cent to 85 per cent in Sabena in July. Its 49.9 per cent stake in LTU was sold in October to Stadtsparkasse Duesseldorf. South Africa's state-owned company, Transnet, announced in November that it would buy back Swissair's 20 per cent stake in South African Airways in the course of 2002. Swissair's 25.1 per cent shareholding in LOT Polish Airlines, which was reduced from 37.6 per cent in December, was also put up for sale.

Transnational alliances

2.34 For a variety of reasons, airlines throughout the world continued to form alliances through various cooperative arrangements, such as codesharing, "blockspace", cooperation in frequent flyer programmes, joint marketing and purchasing, and franchising. Leading motives are to improve traffic feed and to meet an increasingly competitive environment by maximizing the benefits of economies of scale and scope. During 2001, over 250 agreements were concluded, amended or terminated by about 190 airlines worldwide (see Table A1-3), with approximately 45 per cent of them resulting in new partnerships. Over 80 per cent involved codesharing, blockspace or some other form of operational collaboration. Eleven agreements were cargo alliances, two were intermodal agreements and 16 were franchise agreements. Overall, airline alliances continued to thrive and evolve, with partnership relations becoming more intertwined and complex.

2.35 There has been continued formation and expansion of competing "global alliance" groupings each of which has some major airline members based in different continents with fairly extensive networks. As shown in Table A1-4, five global alliance groupings, through which member carriers have combined their route networks, together reportedly carried about 50 per cent of the world scheduled passenger traffic. In 2001, there was no membership change in either the largest group, Star Alliance, or the second largest, Oneworld. The third largest, SkyTeam, was joined by CSA Czech Airlines and Alitalia. Within the alliance group dubbed "Wings", Continental Airlines and KLM agreed in October to start codesharing on the transatlantic routes. KLM and Northwest Airlines concluded comprehensive agreements with Malev in October and November respectively. By contrast, the Swissair-led European alliance group, Qualiflyer, was close to dissolving, resulting from Swissair's divestiture of stakes in partner carriers and its own bankruptcy.

2.36 The expansion and raised level of consolidation within each global alliance and the competition between them raised increasing regulatory concerns in terms of potential adverse impact on competition and consumers. Some proposed major alliances received close examination by relevant national and regional regulatory bodies and, in some cases, certain regulatory measures were introduced to ameliorate the potential anti-competitive aspects of the arrangements.

2.37 In 2001, the U.S. DOT approved and granted antitrust immunity to agreements by United Airlines, Austrian Airlines, Lauda Air, Lufthansa and SAS in January; by United

Airlines and Air New Zealand in April; and by Continental Airlines and Compañia Panameña de Aviación (COPA) in May. The agreement submitted by Delta Air Lines, Air France, Alitalia and CSA Czech Airlines was tentatively approved in December (with final approval expected in January 2002). The DOT continued to review agreements between American Airlines and Transportes Aéreos Centroamericanos (TACA); American Airlines and British Airways (second time application; their first application was dismissed in July 1999); and United Airlines, Austrian Airlines, BMI British Midland, Lauda Air, Lufthansa and SAS. The carriers submitting the latter two agreements requested antitrust immunity to become effective once an open skies agreement between the U.S. and the U.K. has been approved. Tentative approval by the DOT of these two agreements, with conditions, including the divestiture of a significant number of slots at London's Heathrow Airport, is foreseen for January 2002. The European Commission approved the intra-European agreement between BMI British Midland, Lufthansa and SAS in June, and tentatively approved one between Austrian Airlines Group and Lufthansa in December. The Commission continued its investigations of the intra-European agreements notified by Austrian Airlines and SAS, by British Airways and Finnair, and by British Airways and Iberia, as well as several transatlantic alliance agreements.

FARES AND RATES

Tariff establishment

2.38 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 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. Non-IATA interlining has grown rapidly in recent years, stimulated by proliferation of inter-carrier alliances and liberalization of tariff setting. Nonetheless, a study commissioned by IATA estimated that IATA multilateral interlining resulted in annual savings of $2.9 billion for passengers, equivalent to about 10 per cent of fares paid, compared to the counterfactual situation of no IATA multilateral interlining.

2.39 Since interline 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 MITA. In recent years, more States have introduced competition laws or looked more closely at the application of existing rules to the air transport sector. During the year, ACCC advised of its intention to revoke the current IATA blanket

immunity from the Trade Practices Act. In response, IATA sought three separate new authorizations to cover the passenger agency programme, the cargo agency programme, and all other activities, including tariff coordination. The Canadian Competition Bureau has also increased its scrutiny regarding the IATA machinery, asking IATA for a briefing on its activities. The European Commission extended the regulation on existing block exemptions from certain aspects of competition law requirements for another one-year period, which allowed airlines of EEA States to continue participating in IATA consultations on passenger tariffs until 30 June 2002. Prior, the Commission had sent a statement of objections to IATA which had requested an individual exemption for its cargo tariff consultations held since 1998. In response, IATA agreed to end consultations on cargo rates for shipments between points in the EEA. With respect to the U.S. antitrust immunity for tariff coordination activities, the U.S. 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.

2.40 To manage a decline in scope of immunized IATA cooperative activities and to enhance the attractiveness of IATA's multilateral interline system, IATA and its member airlines established a task force to study industry requirements for a multilateral interline system over the next ten years, and forms of industry cooperation to support this system.

Tariff developments

2.41 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 the place of sale and ticketing. In July, the IATA Composite Tariff Conference revisited the so-called Internet package, which had been developed to meet the impact of Internet and electronic ticketing facilities on the application of present fare-construction rules. The proposed package also aims at simplifying these rules. However, the Conference failed again to reach an agreement because of the divergent opinions among members.

2.42 With the softening of the economy and the events of 11 September in the United States, passenger traffic fell sharply (see the section on Traffic below for details) and jet fuel prices began to decline (see Chapter 1 for details). To stimulate demand, airlines cut fares to levels not seen since the late 1980s, including short-term offers targeting leisure passengers. Restrictions such as minimum stay and advance purchase attached to higher fares were also relaxed to boost the demand of business passengers.

PRODUCT DISTRIBUTION

Computer reservation systems

2.43 A computer reservation system (CRS) provides 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 CRSs indirectly.

2.44 In 2001, total air bookings through the four global CRSs — Amadeus, Galileo, Sabre, and Worldspan — remained strong despite a huge downturn in bookings in the fourth quarter. According to an estimate by *Travel Distribution Report*, Sabre retained its lead in air travel bookings (34 per cent), while Galileo retained the second rank (26 per cent), followed by Amadeus (24 per cent) and Worldspan (16 per cent). In response to the fast growing popularity of the Internet for booking air travel, all major vendors continued with programmes to help airlines and travel agents use their respective systems to cut down training costs and improve productivity. With 28 per cent of its total bookings generated through the Internet, Worldspan claimed to be the market leader in e-commerce for the travel industry, processing more than 50 per cent of all online travel agency bookings.

2.45 At the corporate level, two of the four global CRSs changed their ownership structures in 2001. Galileo became the wholly owned subsidiary of Cendant Corporation (a provider of travel and residential real estate services), which purchased Galileo for about $1.8 billion in common stock and cash. Cendant also assumed about $550 million of Galileo's net debt. American Airlines took over a 26 per cent stake in Worldspan held by TransWorld Airlines as a result of its earlier acquisition of the carrier. The remaining two shareholders, Delta Air Lines and Northwest Airlines, kept their 40 and 34 per cent stakes, respectively. At the regional level, Sabre and Galileo purchased the travel distribution businesses of Sabre Pacific and Galileo Southern Cross from Travel Industries Automated System (a travel distribution alliance among Qantas, Air New Zealand and Ansett), making them subsidiaries of Sabre and Galileo, respectively.

2.46 Although many of the original regulatory concerns with CRSs 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. The European Commission has been considering amendments to its existing regulation on CRSs. Thus, it examined several items where implementation of the regulation was proving difficult or where new developments, especially e-commerce, necessitate some revisions. The U.S. DOT continued its review of CRS rules and, for a fourth time, extended the effectiveness of the current CRS rules for another one year (i.e. up to 31 March 2002), allowing additional time to complete a comprehensive review of industry development in light of the airlines' diminishing control of CRSs and the rapid growth of Internet use. At the end of 2001, 31 States either followed the ICAO CRS Code or had CRS regulations which were consistent or compatible with it.

Electronic ticketing

2.47 Electronic ticketing is a method for documenting and distributing airline products without producing paper coupons. In an era of increased competition, electronic ticketing offers considerable cost savings for airlines and travel agents and provides convenience for consumers. IATA estimated that the cost to airlines of one electronic ticket is $1, compared

to $8 for a paper ticket. To encourage the practice and offset the processing costs associated with paper tickets, Alaska Airlines, American Airlines and Continental Airlines started charging $10 (or approximate amounts) for paper tickets purchased from their own ticket outlets when the trip is eligible for electronic ticketing. According to the Airline Reporting Corporation (ARC), which manages travel agents' transactions with air carriers in the United States, electronic tickets processed through ARC accounted for some 63 per cent of the total volume prior to 11 September. Following a sharp drop immediately thereafter, electronic ticketing by travel agents began to climb back and reached 60 per cent in December, compared with 58 per cent a year ago and 48 per cent two years ago. Major CRS vendors introduced new enhancements to their electronic ticketing products to be launched worldwide. For example, Galileo had 33 airlines that offer electronic ticketing in 30 countries.

2.48 Electronic tickets are normally used for single-carrier on-line itineraries; at the same time, interline electronic ticketing (e-interlining, i.e. the ability to use electronic tickets on flights involving more than one airline) increased in popularity as more airlines adopted this practice or expanded its capability on additional routes. The e-interlining products were first introduced by America West Airlines and Continental Airlines in 1999, followed by Air Canada and United Airlines, Continental Airlines and Northwest Airlines, and the Qualiflyer Group (Sabena, Swissair, TAP Air Portugal, Crossair) in 2000. During 2001, Continental Airlines and United Airlines, Lufthansa and SAS, Lufthansa and Austrian Airlines Group, and Northwest Airlines and United Airlines introduced e-interlining products. With the objective of enabling e-interlining on an industry-wide basis, IATA and Société Internationale de Télécommunications Aéronautiques (SITA) announced plans in February for a global interline electronic ticket service that will provide a neutral, centralized database facility for airlines to exchange electronic coupons.

Travel agents

2.49 The advance of information technology, together with the liberalization of tariffs, had a significant impact on the long-established relationship between airlines and travel agents. Until recently, strict tariff regulations and the lack of airlines' own sales outlets often discouraged airlines from introducing low fares or embarking on direct sales. Travel agents acted as distribution outlets on behalf of airlines in exchange for the commission overrides that airlines paid to them. The heavy reliance on travel agents, however, has gradually been diminished as many governments moved towards liberalized tariff regulations and as e-commerce led to the emergence of alternative cost-effective outlets. With the pricing flexibility and Internet facility, airlines have been able to introduce low fares and to sell them directly to consumers thereby cutting down on commission payments. The reduction of commissions accelerated travel agents' modernization toward product specialization, operational efficiencies and the establishment of some service fees. Sometimes reactions from travel agents included threats of boycott and legal actions, as well as a call for government intervention.

2.50 In Europe, British Airways implemented in April a flat-fee booking system depending on the sector flown instead of paying U.K. travel agents 7 per cent commission on each ticket. Lufthansa also announced in June the introduction of a flat-fee booking system

for German travel agents effective from January 2002. In North America, Northwest Airlines and KLM announced in March that they had stopped paying the standard 5 per cent commission to on-line travel agents and instead had capped fees at $10 per ticket. In August, American Airlines reduced commission caps for domestic tickets issued by travel agents in the United States and Canada (from $50 for round-trip and $25 for one-way to $20 and $10, respectively) with all major carriers following suit. The base commission rate of 5 per cent remained unchanged. According to the ARC, commissions for domestic and international tickets in the United States were reduced to 3.64 and 9.63 per cent respectively, compared with 4.15 and 10.49 per cent in 2000.

Internet

2.51 In recent years, on-line Internet sales of air transport services to both consumers and businesses experienced rapid growth. There are broadly two types of e-commerce business in airline product distribution: business-to-consumer (B2C) and business-to-business (B2B). Using the Internet to provide consumers with on-line access to fares, flight schedules and seat availability, as well as to permit booking and other activities, is described as B2C activity. In contrast, B2B describes the on-line Internet exchange of products, services and information among businesses, including airlines, travel agents, CRS vendors and other suppliers of air transport services.

2.52 In the B2C area, a growing number of airlines have developed on-line booking facilities on their World Wide Web sites in order to increase the share of direct sales, reduce costs and better manage their inventory. For example, Delta Air Lines reported that more than 4.2 million of its tickets were purchased from the carrier's Web site, representing 10 per cent of total ticket sales in 2000. Those tickets generated $1.1 billion in revenue, up from the $775 million in 2000 and $290 million in 1999. Low-cost carriers tended to use Internet booking to a much wider extent than major carriers. EasyJet (U.K.) reportedly sold 88.5 per cent of all seats through the Internet in 2001, compared to 71.4 per cent of seats in 2000. Southwest Airlines (U.S.) reported that approximately 40 percent, or $2.1 billion, of its passenger revenue for 2001 was generated by on-line bookings via its Web site.

2.53 In addition to their own Web sites, groups of airlines moved to set up jointly owned B2C Web sites that offer wider product choices than single airline Web sites. Such a joint venture, Orbitz, was first formed in 1999 by five major U.S. airlines. It commenced operations in June after the U.S. DOT gave the tentative antitrust clearance in April. Another joint venture, Opodo, which was set up by nine major European airlines in 2000, launched its first local Web site in Germany in November just after the European Commission gave tentative competition clearance. The Asia/Pacific joint venture, which was established by ten major Asia/Pacific-based airlines in 2000, was named Zuji in August.

2.54 On-line travel agents without conventional retail outlets continued expanding their business. The largest, Travelocity, in which Sabre had an approximately 70 per cent ownership interest, reported that total travel sales reached $3.1 billion, an increase of 27 per cent compared to $2.5 billion for 2000. The second largest, Expedia, reported that total travel

sales reached $2.9 billion, an increase of 62 per cent compared to $1.8 billion for 2000. In July, USA Networks reached an agreement to acquire an approximately 75 per cent stake in Expedia, most of which was held by Microsoft. Some other on-line travel agents have tried to diversify their Web sites by using different approaches. For example, Priceline allows consumers to bid for tickets at fares they choose (a reverse auction system in discount tickets), and retained the third rank. Some small- and medium-sized on-line travel agents, however, failed in their business ventures. Biztravel, which offered customers unprecedented refunds for late or cancelled flights on five major airlines, stopped operations in September. FairAir launched its site in May offering transferable airline tickets, but closed down after only one month of operation.

2.55 In the B2B area, all four major CRS vendors are behind one of the leading B2C on-line travel sites. Amadeus concluded a partnership agreement with Ebookers (the largest on-line travel agent in Europe) and Opodo in May and June respectively, under which Amadeus provides its Web booking engine and country-specific booking service for the sites. In September, Opodo also selected Galileo as the market-specific booking services provider initially for Italy. Sabre continued to provide transaction processing and other e-commerce services to its subsidiary, Travelocity, which would power Zuji, a Japan-based multi-airline Web site. Worldspan is the preferred CRS for some major B2C sites such as Expedia, Orbitz and Priceline.

2.56 Another type of B2B site is an e-marketplace, connecting buyer airlines with suppliers through the Internet with the objective of creating cost savings by integrating and streamlining the supply chains. During 2001, operations started of two on-line aviation purchasing portals, which were established in 2000, namely AeroXchange (founded by 13 airlines and subsequently joined by 20 affiliated airlines) and Cordiem (formerly AirNewco, founded by 9 airlines). Both sites enable airlines to purchase airframes, engines and avionics components, maintenance services, fuel and other goods and services from respective suppliers on-line.

TRAFFIC

2.57 Indicators on the development of airline scheduled traffic in 2001 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.

Carriers

2.58 The total number of air carriers offering scheduled services at the end of 2001 is estimated to have risen to 894, an increase of 87 carriers over 2000. According to data published in multilateral airline schedule guides, 781 air carriers worldwide provided scheduled passenger services at the end of 2001. Another 113 carriers operated scheduled all-freight services at year's end.

Scheduled: world totals

2.59 The total scheduled traffic (domestic plus international) carried by the airlines of the 187 Contracting States of ICAO in 2001 is estimated at about 385 billion tonne-kilometres performed, a decrease of about 4 per cent over 2000. The airlines carried a total of about 1 621 million passengers and some 29 million tonnes of freight in 2001, compared with 1 656 million passengers and 30 million tonnes of freight in 2000 (Table 2-2). In 2001, there was little change in the overall capacity in contrast to the significant reduction in traffic. Hence average load factors on total scheduled services (domestic plus international) decreased from 71 per cent reported in 2000 to 69 per cent in 2001 for passenger traffic and from 61 per cent to 59 per cent for aircraft (weighted).

2.60 Compared with previous years, in 2001 international scheduled traffic showed decreases of about 5 per cent in tonne-kilometres performed, some 1 per cent in passengers carried, and about 6 per cent in freight tonnes carried. Still international traffic accounted for some 59 per cent of total passenger-kilometres performed, 86 per cent of the freight tonne-kilometres performed and some 67 per cent of the total tonne-kilometres performed — these dominant proportions remained almost unchanged compared to the previous year.

2.61 Domestic traffic decreased about 2 per cent, with some 127 billion tonne-kilometres performed in 2001 against about 130 billion tonne-kilometres performed in 2000.

Table 2-2. Scheduled services of airlines of ICAO Contracting States (2001/2000)

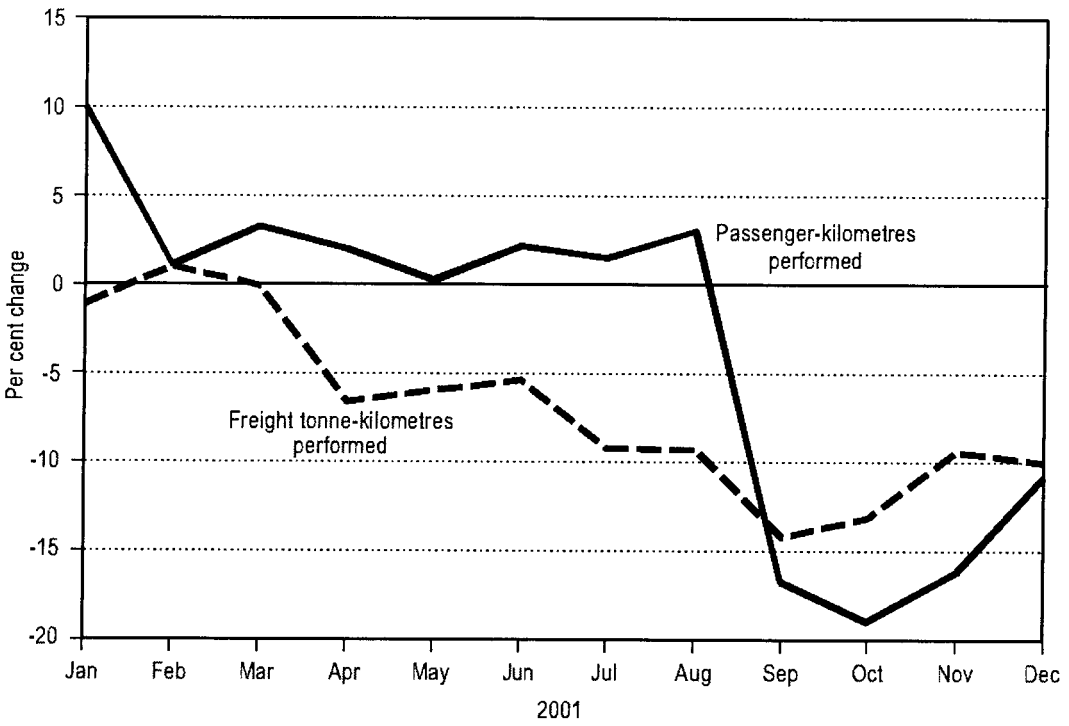
	Passengers carried (millions)	Passenger-km performed (millions)	Passenger load factor (%)	Freight tonnes carried (millions)	Freight tonne-km performed (millions)	Mail tonne-km performed (millions)	Total tonne-km performed (millions)	Weight load factor (%)
TOTAL (International plus domestic)								
2000	1 656	3 017 350	71	30.2	117 960	6 050	401 170	61
2001	1 621	2 930 370	69	28.7	110 680	5 280	385 370	59
Percentage change	-2.1	-2.9	-2.0	-5.0	-6.2	-12.7	-3.9	-2.0
INTERNATIONAL								
2000	538	1 778 110	72	18.8	101 520	2 670	271 400	64
2001	532	1 716 560	70	17.6	94 870	2 620	258 550	62
Percentage change	-1.1	-3.5	-2.0	-6.4	-6.6	-1.9	-4.7	-2.0
DOMESTIC								
2000	1 118	1 239 240	69	11.4	16 440	3 380	129 770	56
2001	1 089	1 213 810	67	11.1	15 810	2 660	126 820	54
Percentage change	-2.6	-2.1	-2.0	-2.6	-3.8	-21.3	-2.3	-2.0

Source: ICAO Air Transport Reporting Form A.

2.62 The traffic decline in 2001 reflects a general economic slowdown accentuated during the latter half of the year by the events of 11 September, which had particular implications for air transport. Reported monthly traffic figures suggest that up to September 2001 there had been little change in overall passenger/freight/mail tonne-kilometres performed over the same period in 2000, a small growth in passenger traffic countered by a significant decrease in freight traffic, as shown in Figure 2-1.

Scheduled: regional breakdown

2.63 From 2000 to 2001, developments in total and international scheduled traffic varied considerably among regions of carrier registration with respect to both passengers, freight and mail (Table 2-3). In terms of passenger-kilometres performed, the change in traffic ranged from a decrease of some 6 per cent in total traffic for the airlines registered in Latin America and the Caribbean as well as in North America to an increase of about 3 per cent for airlines registered in the Middle East. Changes in the passenger-kilometres performed on international services ranged from a decrease of about 9 per cent for airlines registered in Latin America and the Caribbean to an increase of almost 3 per cent for those registered



Source: ICAO, IATA and others.

Figure 2-1. Monthly percentage change of passenger and freight traffic — World (2001/2000)

Table 2-3. Growth of scheduled traffic by region of airline registration — World (2001/2000) (annual percentage change)

	Passengers carried	Passenger-kilometres	Freight tonne-km performed	Mail tonne-km performed	Total tonne-km performed
TOTAL (international plus domestic)					
Africa	-2.2	1.3	-3.1	9.1	-0.2
Asia and Pacific	2.4	0.1	-5.7	4.0	-1.7
Europe	0.7	-2.1	-6.5	0.0	-3.6
Middle East	2.1	3.2	-0.5	4.3	2.0
North America	-6.5	-5.7	-7.2	-22.3	-6.5
Latin America and Caribbean	-2.2	-5.5	-7.4	-5.3	-5.8
Total	-2.1	-2.9	-6.2	-12.7	-3.9
INTERNATIONAL					
Africa	-0.6	2.3	-2.9	18.9	0.4
Asia and Pacific	-0.4	-3.0	-6.9	2.7	-4.8
Europe	0.9	-2.9	-6.6	0.9	-4.3
Middle East	0.6	2.9	-0.5	4.4	1.7
North America	-6.0	-6.3	-7.1	-10.4	-6.7
Latin America and Caribbean	-8.0	-9.1	-9.0	-12.7	-8.8
Total	-1.1	-3.5	-6.6	-1.9	-4.7

Source: ICAO Air Transport Reporting Form A.

in the Middle East. In terms of freight tonne-kilometres performed, carriers registered in Latin America and the Caribbean as well as in North America each experienced a decrease of about 7 per cent in total traffic with an even steeper 9 per cent contraction of the former in international traffic. At the other end of the scale, carriers registered in the Middle East showed decreases of less than 1 per cent each in total and international freight tonne-kilometres performed.

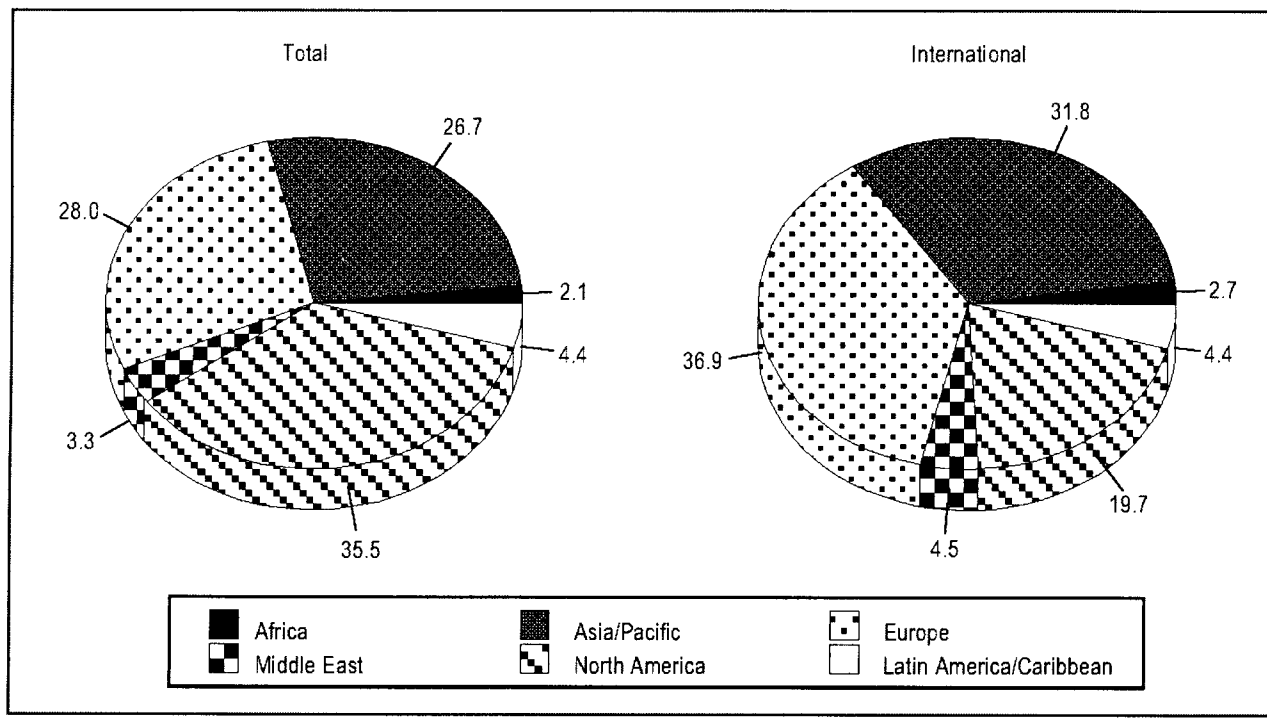
2.64 The differences in regional traffic development between 2000 and 2001 affected the distribution of this traffic. The regional distribution for total and for international scheduled

traffic in 2001 is shown in Figure 2-2 (detailed traffic data by region are shown in Table A2-1 in Appendix 2). In terms of total scheduled traffic (international plus domestic) in 2001, the airlines of North America carried some 36 per cent of world traffic. However, the largest share of international scheduled traffic (about 37 per cent) was carried by the airlines of Europe.

2.65 In 2001, airlines registered in Europe and Asia/Pacific showed the highest average annual weight load factor on international scheduled services (about 64 per cent), while those in Africa showed the lowest average load factor (some 51 per cent). Compared with 2000, the weight load factors for international scheduled services (shown in Table A2-1 in Appendix 2) represent a decrease of about 5 percentage points for the airlines of Latin America and the Caribbean, 4 percentage points for those of Asia/Pacific, 3 percentage points for those of North America and 2 percentage points for those of Europe. Airlines of Africa and the Middle East showed an increase in the average weight load factor for international scheduled services of about one percentage point each.

Scheduled: carrier rankings

2.66 Table 2-4 shows the top 30 air carriers in the world in 2001 in terms of the overall volume of passenger-kilometres performed, freight and mail tonne-kilometres performed and



Source: ICAO Air Transport Reporting Form A.

Figure 2-2. Percentage distribution of scheduled traffic according to region of airline registration — 2001 (total tonne-kilometres performed)

total (passenger, freight and mail) tonne-kilometres performed, compared with the ranking of the same carriers in 2000 and in 1992. Table 2-5 shows the top 30 air carrier rankings according to the same parameters but in terms of international scheduled traffic.

2.67 In 2001, 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, 11 were registered in Asia/Pacific, 10 in Europe, 7 in North America and one each in the Middle East and in Latin America and the Caribbean.

Scheduled: country rankings

2.68 Rankings for the top 30 countries or groups of countries by volume of scheduled traffic generated by their airlines in 2001, 2000 and 1992 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 2-6 and 2-7. In 2001 approximately 43 per cent of the total volume of scheduled passenger, freight and mail traffic was accounted for by the airlines of the United States, Japan and the United Kingdom (32, 6 and 5 per cent respectively). On international services, some 37 per cent of all traffic was carried by airlines of four countries, namely, the U.S., the U.K., Germany and Japan (17, 7, 7 and 6 per cent, respectively).

Non-scheduled

2.69 It is estimated that in 2001 there was little change in total international non-scheduled passenger-kilometres performed throughout the world (Table 2-8) with the share of such traffic in overall international air passenger traffic increasing to about 13.5 per cent. Non-scheduled traffic in Europe remains the largest single component of the world charter market. Domestic non-scheduled passenger traffic is estimated to represent some 6 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.

FLEETS

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

Table 2-4. Top 30 scheduled air carriers in 2001 and their ranking in 2000 and 1992 — TOTAL (international and domestic) scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992	Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992	Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992
United	187 639	1	1	2	Federal Express	10 860	1	1	1	American	20 397	1	2	1
American	170 853	2	2	1	Lufthansa	7 191	2	2	2	United	20 376	2	1	2
Delta	156 549	3	3	3	SIA	5 850	3	3	11	Delta	16 374	3	3	3
Northwest	117 682	4	4	5	Air France	4 912	4	5	3	Lufthansa	16 307	4	4	7
British Airways	97 976	5	5	6	Korean Air	4 685	5	4	6	Northwest	13 821	5	6	5
Air France	94 401	6	8	12	JAL	4 315	6	6	4	British Airways	13 514	6	5	6
Continental	92 702	7	6	7	KLM	4 097	7	8	9	Air France	13 408	7	7	9
Lufthansa	90 525	8	7	10	Cathay Pacific	3 938	8	10	12	SIA	12 475	8	8	12
JAL	81 700	9	9	9	Cargolux	3 768	9	12	—	JAL	11 598	9	9	8
US Airways	73 944	10	10	8	British Airways	3 674	10	9	8	Federal Express	10 860	10	10	11
Southwest	71 602	11	12	22	United	3 489	11	7	7	KLM	9 884	11	12	14
SIA	69 107	12	11	15	American	3 312	12	13	10	Continental	9 313	12	11	10
Qantas	67 822	13	13	17	Northwest	3 145	13	11	5	Korean Air	8 471	13	13	15
Air Canada	66 779	14	18	23	Asiana	2 353	14	16	42	Qantas	8 374	14	15	19
KLM	57 848	15	14	16	Delta	2 284	15	14	13	Cathay Pacific	8 197	15	14	17
All Nippon Airways	53 369	16	15	14	United Parcel	2 273	16	17	31	Air Canada	7 779	16	21	24
Cathay Pacific	44 751	17	16	18	Nippon Cargo	2 018	17	15	18	US Airways	7 329	17	16	13
Thai Airways	44 142	18	20	24	Qantas	1 847	18	19	17	Southwest	6 678	18	18	30
Korean Air	43 201	19	17	19	Thai Airways	1 724	19	22	21	Thai Airways	5 702	19	20	22
Iberia	41 265	20	22	20	Air Canada	1 721	20	27	25	All Nippon Airways	5 689	20	17	20
Alitalia	36 124	21	21	21	Swissair	1 694	21	18	19	Alitalia	5 127	21	19	21
Malaysian Airlines	35 869	22	23	30	Air China	1 626	22	24	—	Malaysian Airlines	5 007	22	23	29
TWA	33 411	23	19	11	Alitalia	1 551	23	21	16	Swissair	4 743	23	22	25
Swissair	31 076	24	24	29	Malaysian Airlines	1 535	24	20	24	Iberia	4 610	24	24	23
America West	30 663	25	25	26	Emirates Airlines	1 516	25	28	48	Cargolux	3 768	25	29	—
Virgin Atlantic	28 548	26	26	44	All Nippon Airways	1 338	26	23	27	Asiana	3 751	26	27	57
Varig	25 777	27	27	28	Lan Chile	1 324	27	29	45	Emirates Airlines	3 721	27	30	56
China Southern	24 349	28	32	—	Varig	1 200	28	30	22	Virgin Atlantic	3 599	28	26	42
Emirates Airlines	23 126	29	33	58	Polar Air Cargo	1 159	29	26	—	Varig	3 578	29	28	26
SAS	22 956	30	29	31	Saudia	1 014	30	31	28	Air China	3 412	30	31	—

1. Most 2001 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.

Source: ICAO Air Transport Reporting Form A and IATA.

Table 2-5. Top 30 scheduled air carriers in 2001 and their ranking in 2000 and 1992 — INTERNATIONAL scheduled traffic carried[1]

PASSENGER-KILOMETRES PERFORMED					FREIGHT AND MAIL TONNE-KILOMETRES PERFORMED					TOTAL TONNE-KILOMETRES PERFORMED				
Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992	Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992	Carrier	Estimated 2001 (millions)	Ranking 2001	2000	1992
British Airways	96 065	1	1	1	Lufthansa	7 146	1	1	1	Lufthansa	15 676	1	1	2
Lufthansa	84 651	2	2	3	SIA	5 850	2	2	8	British Airways	13 343	2	2	1
United	75 894	3	3	2	Air France	4 750	3	4	2	SIA	12 475	3	3	6
Air France	72 861	4	5	8	Korean Air	4 576	4	3	4	Air France	11 308	4	4	4
SIA	69 107	5	6	7	Federal Express	4 438	5	6	7	JAL	10 042	5	5	3
JAL	65 013	6	4	6	KLM	4 097	6	7	6	KLM	9 882	6	6	8
American	58 717	7	7	4	JAL	4 012	7	5	3	United	9 333	7	7	5
KLM	57 829	8	8	10	Cathay Pacific	3 938	8	9	10	American	8 248	8	10	9
Northwest	52 584	9	9	5	Cargolux	3 768	9	10	—	Cathay Pacific	8 197	9	9	11
Qantas	51 261	10	10	11	British Airways	3 673	10	8	5	Korean Air	7 968	10	8	10
Air Canada	45 401	11	19	27	United	2 503	11	11	13	Northwest	6 902	11	11	7
Cathay Pacific	44 751	12	11	12	American	2 376	12	13	14	Qantas	6 661	12	12	12
Thai Airways	40 584	13	14	15	Asiana	2 329	13	16	42	Air Canada	5 531	13	20	25
Delta	39 693	14	12	9	United Parcel	2 273	14	15	25	Thai Airways	5 345	14	15	16
Korean Air	38 318	15	13	14	Northwest	2 131	15	12	9	Delta	4 985	15	13	13
Continental	32 256	16	15	16	Nippon Cargo	2 018	16	14	15	Swissair	4 725	16	14	15
Iberia	30 920	17	20	17	Swissair	1 693	17	17	16	Malaysian Airlines	4 515	17	17	21
Swissair	30 889	18	16	18	Thai Airways	1 687	18	21	17	Alitalia	4 455	18	16	14
Malaysian Airlines	30 666	19	18	21	Qantas	1 684	19	20	11	Federal Express	4 438	19	19	17
Alitalia	29 440	20	17	13	Alitalia	1 541	20	19	12	Cargolux	3 768	20	22	—
Virgin Atlantic	28 548	21	21	32	Emirates Airlines	1 516	21	24	47	Emirates Airlines	3 721	21	26	44
Emirates Airlines	23 126	22	24	45	Malaysian Airlines	1 479	22	18	20	Continental	3 702	22	18	18
Air New Zealand	18 917	23	23	30	Air Canada	1 413	23	27	24	Virgin Atlantic	3 599	23	21	37
All Nippon Airlines	18 339	24	22	31	Delta	1 413	24	22	22	Iberia	3 577	24	23	19
SAS	18 101	25	27	20	Air China	1 348	25	23	—	Asiana	3 537	25	24	50
Varig	17 526	26	26	22	LAN Chile	1 270	26	25	43	Air New Zealand	2 685	26	27	30
SAA	16 954	27	28	40	Varig	959	27	29	21	Varig	2 638	27	28	20
Sabena	15 320	28	25	41	Polar Air Cargo	934	28	31	—	All Nippon Airways	2 609	28	25	33
Hapag-lloyd	14 640	29	33	—	Saudia	930	29	32	23	SAS	2 448	29	30	27
Aeroflot (ARA)	14 237	30	34	—	Virgin Atlantic	919	30	30	41	Air China	2 353	30	31	—

1. Most 2001 data are estimates, thus the ranking and the rate of increase or decrease may change when final data become available.

Source: ICAO Air Transport Reporting Form A and IATA.

Table 2-6. Top 30 countries or group of countries in 2001 and their ranking in 2000 and 1992 — 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 2001 (millions)	Ranking 2001	2000	1992	Country or group of countries	Estimated 2001 (millions)	Ranking 2001	2000	1992	Country or group of countries	Estimated 2001 (millions)	Ranking 2001	2000	1992
United States	1 044 480	1	1	1	United States	28 042	1	1	1	United States	125 540	1	1	1
Japan	162 332	2	2	4	Japan	7 627	2	2	2	Japan	21 730	2	2	3
United Kingdom	160 042	3	3	2	Germany	7 026	3	4	4	United Kingdom	20 041	3	3	2
France	113 115	4	5	5	Republic of Korea	6 957	4	3	6	Germany	18 032	4	4	5
Germany	111 641	5	4	6	Singapore	5 774	5	5	8	France	15 207	5	5	6
China[2]	105 870	6	6	9	France	4 868	6	6	5	China[2]	13 802	6	9	12
Hong Kong SAR[3]	48 424	—	—	—	United Kingdom	4 549	7	7	3	Hong Kong SAR[3]	9 692	—	—	—
Macao SAR[4]	1 908	—	—	—	China[2]	4 232	8	9	12	Macao SAR[4]	214	—	—	—
Australia	84 931	7	7	8	Hong Kong SAR[3]	5 051	—	—	—	Singapore	12 595	7	7	8
Singapore	70 232	8	9	10	Macao SAR[4]	23	—	—	—	Republic of Korea	12 222	8	6	7
Netherlands	70 117	9	8	11	Netherlands	4 116	9	8	7	Netherlands	11 281	9	8	9
Canada	68 804	10	10	7	Luxembourg	3 768	10	10	120	Australia	10 043	10	10	10
Republic of Korea	58 998	11	11	13	Gulf States[5]	2 241	11	11	22	Canada	7 977	11	11	11
Spain	55 324	12	12	14	Australia	1 678	12	16	11	Gulf States[5]	6 042	12	17	24
Russian Federation	48 026	13	15	—	Thailand	1 669	13	17	16	Spain	5 897	13	14	15
Brazil	46 603	14	13	15	Switzerland	1 642	14	12	15	Brazil	5 726	14	13	14
Thailand	44 142	15	16	16	Canada	1 605	15	14	10	Thailand	5 702	15	16	16
Italy	40 950	16	14	12	Malaysia	1 533	16	13	18	Italy	5 567	16	12	13
Gulf States[5]	39 814	17	19	26	Italy	1 521	17	15	13	Russian Federation	5 262	17	19	—
Malaysia	35 869	18	17	23	Brazil	1 467	18	18	14	Malaysia	5 007	18	18	20
Switzerland	33 470	19	18	22	Chile	1 279	19	19	28	Switzerland	4 970	19	15	17
Mexico	29 389	20	20	17	Saudi Arabia	1 000	20	22	—	Luxembourg	3 821	20	20	104
Scandinavia[6]	28 691	21	21	19	Russian Federation	895	21	20	—	Scandinavia[6]	3 483	21	21	21
India	25 576	22	22	21	Spain	879	22	24	20	New Zealand	3 030	22	23	25
New Zealand	23 154	23	23	25	Belgium	853	23	21	27	Mexico	2 993	23	22	23
South Africa	22 061	24	24	29	New Zealand	763	24	25	25	Saudi Arabia	2 860	24	26	18
Saudi Arabia	20 217	25	25	20	South Africa	747	25	27	31	India	2 842	25	25	22
Indonesia	17 126	26	27	18	Israel	734	26	23	17	South Africa	2 739	26	27	30
Ireland	16 151	27	32	42	Scandinavia[6]	633	27	26	23	Belgium	2 356	27	24	31
Belgium	15 320	28	26	36	Colombia	625	28	28	29	Chile	2 331	28	28	37
Turkey	15 041	29	28	37	India	518	29	29	24	Israel	1 960	29	29	26
Austria	13 765	30	31	39	Indonesia	415	30	30	21	Indonesia	1 905	30	31	19

1. Most 2001 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.

Source: ICAO Air Transport Reporting Form A and IATA.

Table 2-7. Top 30 countries or groups of countries in 2001 and their ranking in 2000 and 1992 — 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 2001 (millions)	Ranking 2001	2000	1992	Country or group of countries	Estimated 2001 (millions)	Ranking 2001	2000	1992	Country or group of countries	Estimated 2001 (millions)	Ranking 2001	2000	1992
United States	287 646	1	1	1	United States	17 637	1	1	1	United States	44 420	1	1	1
United Kingdom	151 706	2	2	2	Germany	7 010	2	4	4	United Kingdom	19 318	2	2	2
Germany	103 116	3	3	4	Japan	6 843	3	2	3	Germany	17 163	3	3	4
Japan	90 230	4	4	3	Republic of Korea	6 832	4	3	6	Japan	15 443	4	4	3
France	76 155	5	5	6	Singapore	5 774	5	5	8	Singapore	12 595	5	5	6
Singapore	70 232	6	7	5	France	4 608	6	7	5	France	11 626	6	8	5
Netherlands	70 031	7	6	7	United Kingdom	4 545	7	6	2	Republic of Korea	11 505	7	6	8
Australia	54 549	8	9	8	Netherlands	4 115	8	8	7	Netherlands	11 272	8	7	7
Republic of Korea	51 744	9	8	10	Luxembourg	3 768	9	9	114	Australia	7 005	9	9	9
Canada	46 436	10	10	9	China[3]	2 385	10	10	15	Gulf States[2]	6 023	10	12	19
Thailand	40 584	11	11	12	Hong Kong SAR[4]	5 051	—	—	—	Canada	5 621	11	10	11
Gulf States[2]	39 677	12	13	20	Macao SAR[5]	23	—	—	—	Thailand	5 345	12	13	13
Spain	37 295	13	14	13	Gulf States[2]	2 241	11	11	20	Switzerland	4 945	13	11	12
Switzerland	33 211	14	12	14	Switzerland	1 641	12	12	11	Italy	4 573	14	14	10
Italy	30 706	15	15	11	Thailand	1 634	13	15	13	China[3]	4 529	15	16	18
Malaysia	30 666	16	16	17	Italy	1 511	14	14	10	Hong Kong SAR[4]	9 692	—	—	—
China[3]	23 699	17	18	22	Malaysia	1 477	15	13	17	Macao SAR[5]	214	—	—	—
Hong Kong SAR[4]	48 424	—	—	—	Australia	1 465	16	16	9	Malaysia	4 515	16	15	16
Macao SAR[5]	1 908	—	—	—	Canada	1 352	17	17	12	Spain	4 173	17	17	15
Brazil	21 502	18	17	15	Chile	1 223	18	18	27	Luxembourg	3 821	18	18	99
Scandinavia[6]	20 399	19	21	16	Brazil	978	19	19	16	Brazil	3 050	19	19	14
Russian Federation	19 343	20	22	—	Saudi Arabia	919	20	21	18	New Zealand	2 685	20	21	23
New Zealand	18 917	21	19	24	Belgium	853	21	20	23	Scandinavia[6]	2 666	21	22	20
South Africa	17 192	22	23	32	Spain	786	22	24	19	Belgium	2 356	22	20	28
Ireland	16 104	23	29	37	New Zealand	751	23	23	24	Russian Federation	2 274	23	23	—
Belgium	15 320	24	20	33	Israel	734	24	22	14	South Africa	2 225	24	26	31
Mexico	14 507	25	24	25	South Africa	691	25	27	31	Saudi Arabia	2 172	25	24	17
India	13 888	26	28	26	Scandinavia[6]	616	26	26	21	Chile	1 981	26	27	35
Austria	13 660	27	26	35	Colombia	577	27	28	28	Israel	1 927	27	25	21
Saudi Arabia	13 495	28	27	21	Russian Federation	524	28	25	—	Austria	1 761	28	28	36
Israel	13 146	29	25	27	India	380	29	30	26	India	1 682	29	29	26
Turkey	12 184	30	30	36	Austria	356	30	29	44	Turkey	1 601	30	31	38

1. Most 2001 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 SARs of Hong Kong and Macao, and that of the Taiwan province of China.
4. Traffic for the Hong Kong SAR.
5. Traffic for the Macao SAR.
6. Three States — Denmark, Norway and Sweden.

Source: ICAO Air Transport Reporting Form A and IATA.

Table 2-8. Estimated international non-scheduled revenue passenger traffic (2000 and 2001)

Category	2000 Passenger-km performed (millions)	2000 Percentage of total carriers	2000 Percentage of total traffic	2001 Passenger-km performed (millions)	2001 Percentage of total carriers	2001 Percentage of total traffic	Annual change (%) 2001/2000
Scheduled carriers	147 350	56	—	148 161	55	—	0.6
Non-scheduled carriers	118 110	44	—	119 089	45	—	0.8
TOTAL NON-SCHEDULED TRAFFIC	265 460	100	13.0	267 250	100	13.5	0.7
TOTAL SCHEDULED TRAFFIC	1 778 110	—	87.0	1 716 560	—	86.5	-3.5
TOTAL TRAFFIC	2 043 570	—	100.0	1 983 810	—	100.0	-2.9

Source: ICAO Air Transport Reporting Form A.

Orders and deliveries

2.71 In 2001, 990 turbojet aircraft were ordered, compared with 1 553 in 2000. The financial commitment represented by orders placed with the major aircraft manufacturers in 2001 for these aircraft is estimated to be about $69 billion, down from $80 billion the previous year. In 2001, 1 219 aircraft were delivered, compared with 1 009 in 2000. The backlog of unfilled orders increased from 3 649 aircraft at the end of 2000 to 3 799 aircraft at the end of 2001. The status of orders and deliveries for the year 2001 is shown in Table A2-2, which gives data by manufacturer and model for turbojet and turboprop aircraft.

2.72 In 2001, turbojets remained the most active aircraft type in terms of orders and deliveries as shown in Table 2-9. In line with their proportion of the total fleet (see Table 2-10), turbojet aircraft accounted for about 60 per cent of the orders, 60 per cent of the deliveries made and 63 per cent of the backlog of unfulfilled orders. A total of 89 turboprop aircraft were ordered, 109 were delivered and 121 were on backlog order that year.

Composition

2.73 Between 1992 and 2001, the number of commercial air transport fixed-wing aircraft in service with a take-off mass of 9 000 kg and over increased from 14 919 to 20 771, as shown in Table 2-10. During this period, the number of jet aircraft increased from 12 008 to 16 229, while turboprop aircraft increased from 2 713 to 4 386. On the other hand, the number of

piston-engined aircraft declined from 198 to 156, 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 data.

2.74 BACK Aviation Solutions reported that, as at the end of 2001, there were 1 037 western-built commercial jets in storage, compared with 609 jets at the end of the previous year. The number of wide-bodies in storage increased from 221 in 2000 to 345 in 2001 with A300s, 747s, DC-10s and L1011s accounting for 64 per cent of aircraft in the group. Among narrow-bodies, 727s and 737s accounted for nearly half the aircraft in the group. The number of western-built jets available for sale or lease increased for the fourth year in a row, from 614 in December 2000 to about 800 in December 2001. Available wide-bodies were up by 54 to 255.

Table 2-9. Main aircraft types ordered and delivered (2001)

Aircraft	Orders	Deliveries	Backlog
Canadair RJ	230	152	562
Boeing 737	124	298	752
Airbus 320	101	120	492
Airbus 380	78	—	78
Embraer RJ	62	166	516

Source: Aircraft manufacturers.

Table 2-10. Commercial aircraft fleet[1] in active service (year end 1992, 2000, 2001)

	TURBOJET		TURBOPROP		PISTON ENGINE		
Year	Number	Percentage	Number	Percentage	Number	Percentage	TOTAL (aircraft all types)
1992	12 008	80.5	2 713	18.2	198	1.3	14 919
2000	16 045	82.4	3 267	16.8	157	0.8	19 469
2001	16 229	78.1	4 386	21.1[2]	156	0.8	20 771

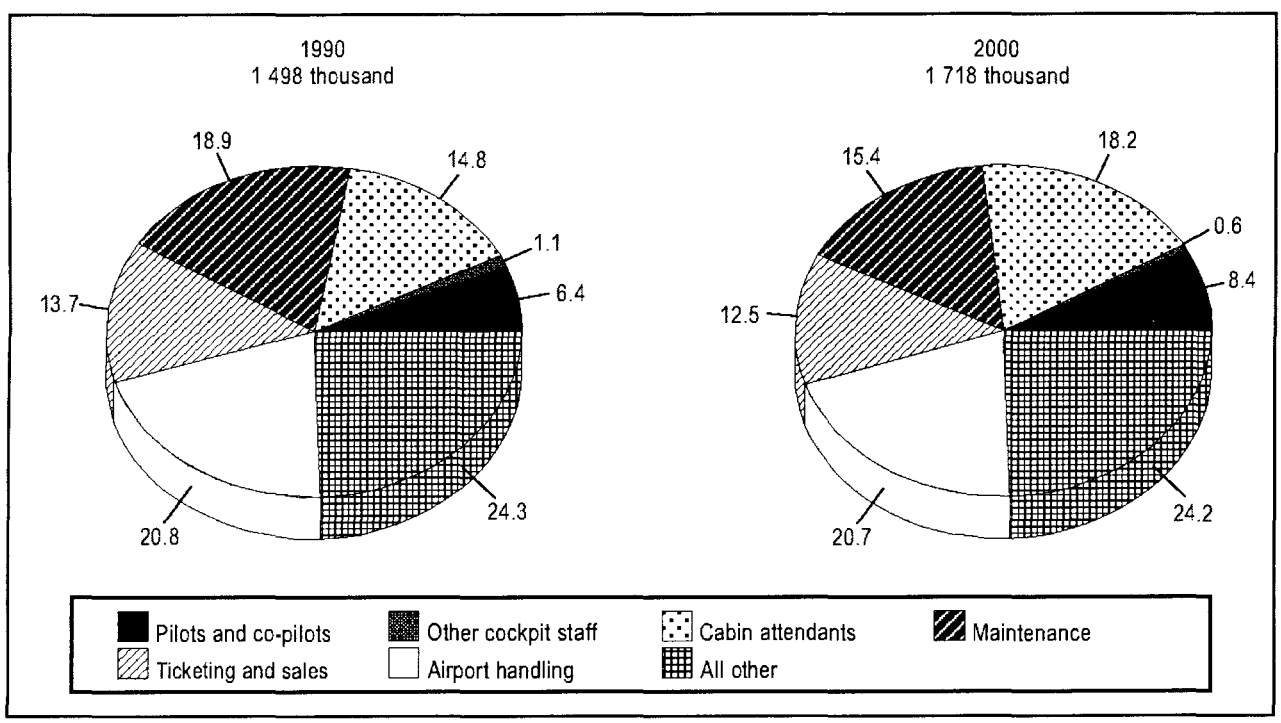
1. Aircraft with a maximum take-off mass of less than 9 000 kg (20 000 lb) are not included.
2. 2001 data have a more comprehensive coverage of turboprop-powered aircraft manufactured in China and the Russian Federation.

Source: BACK Aviation Solutions.

PERSONNEL

2.75 In 2000, commercial air transport services provided employment for an estimated 2 million persons who worked for about 3 000 commercial air carriers worldwide in management, traffic planning, flight operations, marketing, sales and other functions (2001 data were not available at the time of writing).

2.76 For 1990 and 2000, Figure 2-3 compares the composition of airline personnel by occupational groups for scheduled and non-scheduled IATA member airlines which had a workforce of 1.5 million people in 1990 and 1.7 million in 2000. The increased share of pilots/co-pilots and cabin attendants employed is a direct reflection of the expansion in worldwide air transport services, which rose during that period at a rate of 5.5 per cent per annum in terms of total tonne-kilometres performed on scheduled services and at 7.5 per cent 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, passenger numbers and air cargo volumes, the share of airport handling staff remained unchanged (a slight increase in absolute terms), while the share of maintenance personnel decreased (unchanged in 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



Source: IATA.

Figure 2-3. Airline personnel of IATA members by occupational group — World (1999 and 2000)

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 4.9 per cent annually from 1990 to 2000.

FINANCES

Financial results

2.77 Preliminary estimates for 2001 indicate that the world's scheduled airlines as a whole experienced an operating loss of 3.6 per cent of total operating revenues, compared with an operating profit of 3.3 per cent achieved in 2000. The operating revenues of scheduled airlines are tentatively estimated at $305.3 billion in 2001, a decrease of about 7 per cent compared with the $328.5 billion earned in 2000. Operating revenues per tonne-kilometre performed decreased from 77.0 cents in 2000 to an estimated 74.6 cents in 2001. The decrease of $23.2 billion in operating revenues for 2001 compared to 2000 is due to a combination of factors: decline in traffic and yields, and exchange fluctuations. It is estimated that the drop of about 4.0 per cent in traffic compared with the year 2000 adversely impacted the operating revenues for 2001 by $13.4 billion while a drop in yields resulted in a decline of $2.9 billion. It is estimated that the weakening of major currencies vis-à-vis the U.S. dollar resulted in a further reduction in operating revenues by $6.9 billion.

2.78 The operating expenses for the same airlines are tentatively estimated at $316.2 billion in 2001, a marginal decrease of about 0.5 per cent ($1.6 billion) over the $317.8 billion incurred in 2000. Operating expenses per tonne-kilometre available decreased from 45.79 cents to an estimated 45.64 cents in 2001. The marginal decline of $1.6 billion in operating expenses for 2001 compared to 2000 is mainly due to a 0.2 per cent decrease in capacity along with a small relief in fuel costs. Average fuel prices were 72.45 cents in 2001, a decline of 10.7 per cent when compared with 2000 but still 44.6 per cent higher than average fuel prices in 1999.

2.79 The estimated operating result for the world's scheduled airlines is the balance between estimated operating revenues and expenses and is therefore subject to a relatively wide margin of error. For 2001, the operating loss is estimated at about $10.9 billion compared to the 2000 operating profit of $10.7 billion. The operating loss in 2001 reflects a general economic slowdown accentuated during the later half of the year by the events of 11 September. With virtually unchanged capacity, the material decline in traffic pushed down the overall load factor from 61.5 per cent in 2000 to 59.1 per cent in 2001. While unit costs remained at the same levels as in 2000, the decline in yields pushed up the break-even load factors from 59.5 per cent in 2000 to 61.2 per cent in 2001, thus adversely affecting the operating profitability of the world's airlines.

2.80 According to estimated regional results for 2001, carriers in North America were the most severely hit among all regions, accruing 94 per cent of the total operating losses. They accounted for about 39 per cent of total operating revenues and 41 per cent of total operating costs. Preliminary estimates indicate that the operating loss of scheduled airlines based in

North America in 2001 amounted to $10.3 billion compared to an operating profit of $6.8 billion in 2000. Financial results expected for 2001 from airlines of Asia and the Pacific indicate a small operating profit while those of other regions point to a small operating loss. For airlines of the rest of the world combined, the estimated operating loss for 2001 is $0.6 billion compared to an operating profit of $3.9 billion shown for 2000.

2.81 The net result is derived from the operating result by taking into account non-operating revenue items and taxes. Preliminary estimates suggest that in 2001 the world's scheduled airlines accrued a net loss of $12 billion as compared to a net profit of $3.7 billion in 2000, mainly on account of the operating losses incurred in 2001. Information on both operating and net results over the period 1990–2001 and distribution of operating revenues and expenses by item in 1990 and 2000 can be found in Tables 5-4 and 5-5 in Chapter 5, respectively.

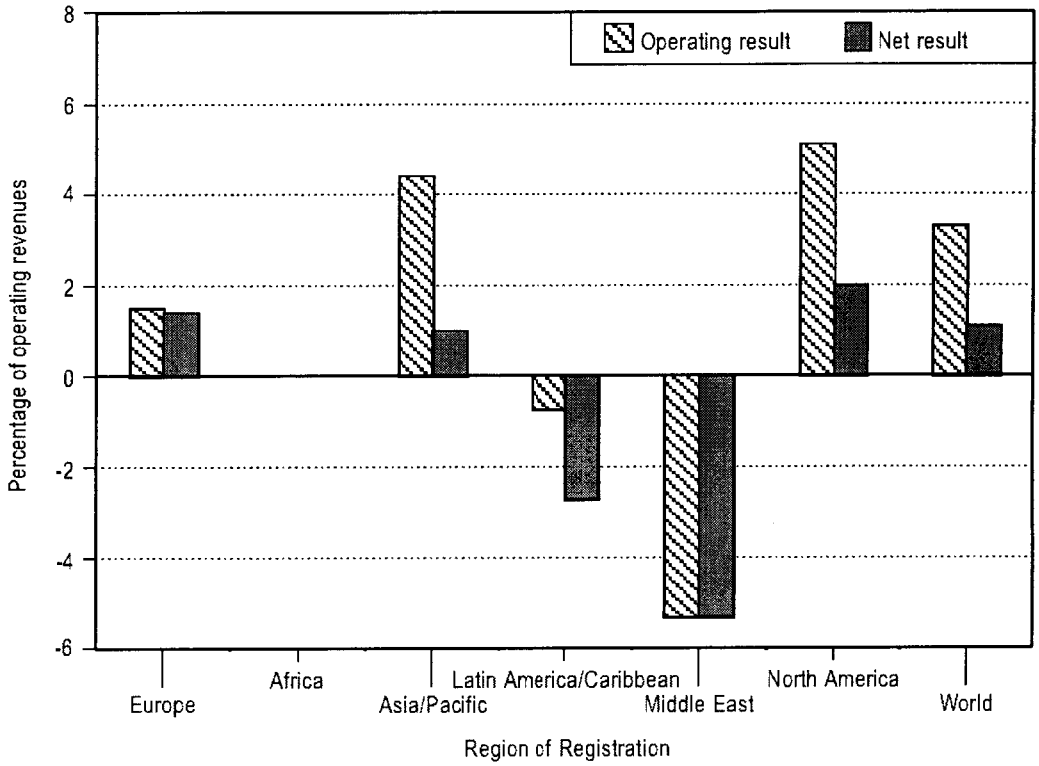
2.82 The aggregate estimates of the world's scheduled airlines do not portray the considerable difference in results achieved by individual airlines. In 2000 (complete data were not available for 2001 at the time of writing) it is estimated that about 58 per cent of airlines achieved operating profits, while 42 per cent reported operating losses. On a regional basis, airlines in all ICAO statistical regions, with the exception of Latin America/Caribbean and the Middle East, experienced positive aggregated operating results in 2000, with operating profits or losses expressed as a percentage of operating revenues. The range in operating results ranks from 5.2 per cent profits for the airlines in North America to a loss of 5.3 per cent for those in the Middle East region. Net results ranged from a surplus of 2.0 per cent of operating revenues for the airlines based in North America to a net loss of 5.3 per cent of operating revenues for those in the Middle East region (Figure 2-4).

2.83 Available data from non-scheduled carriers are insufficient to produce accurate financial estimates for 2001. In 2000, the operating revenues of non-scheduled carriers are tentatively estimated at $10.3 billion compared with $7.9 billion earned in 1999. In 2000 these carriers, as a group, had an operating profit estimated at $620 million and a net result, after taking into account the non-operating revenue items and taxes, of some $290 million.

Consolidated balance sheet

2.84 At the end of the fiscal year 2000, the total assets of the scheduled airlines of ICAO Contracting States stood at $411.6 billion, compared with $394.6 billion at the end of the fiscal year 1999 (Table 2-11). Of these, 22 per cent were represented by current assets, some 60 per cent by fixed assets and the remainder by other assets.

2.85 At the end of 2000, the net value of the aircraft fleet (i.e. after depreciation charges) was $196.1 billion, compared with $182.3 billion at the end of 1999, representing an increase of 8 per cent, accounting for about 48 per cent of total assets. Accumulated depreciation charges stood at about $146.7 billion of which $109.6 billion were for the aircraft fleet, representing some 36 per cent of the gross value of the fleet. The remaining accumulated depreciation charges covered ground property and equipment and represented some 52 per cent of their gross value.



Source: ICAO Air Transport Reporting Form EF-1.

Figure 2-4. Financial results of scheduled airlines by region — World (2000)

2.86 Between the fiscal years 1999 and 2000, the value of stockholders' equity increased by some 2 per cent (from $95.7 billion to $97.7 billion), representing a 24 per cent share of total liabilities. During the same period, long-term debt increased from $125.2 billion to $130.0 billion, which expressed in relative terms (32 per cent of total liabilities) remained unchanged over 1999. At the end of the fiscal year 2000, current liabilities, including unearned transportation revenue, stood at $111.3 billion, or some 27 per cent of total liabilities. Unearned transportation revenue represented about 6 per cent of total liabilities and some 8 per cent of the total traffic revenue for 2000.

2.87 Long-term trends in the balance sheet elements may be discerned from comparing the figures for 2000 with those for 1992, which are also contained in Table 2-11. At the end of the 2000 fiscal year, total assets stood at $411.6 billion compared with $266.6 billion at the end of 1992. Relative to the totals, the most significant difference between 1992 and 2000 is the decrease in the proportion of current assets (from 25 to 22 per cent of the total) and the corresponding increase in other assets. The proportion of other assets increased (from 15 per cent of total assets in 1992 to 18 per cent in 2000); however, there was a slight relative decrease in investments in affiliated companies (from about 5 per cent of total assets in 1992 to 3 per cent in 2000), an increase in the relative amounts represented by flight equipment and a reduction in the relative amounts represented by ground property and equipment.

Table 2-11. Consolidated balance sheet — Scheduled airlines of ICAO Contracting States[1] (end of fiscal years 1992, 1999 and 2000)

	1992		1999		2000	
	U.S.$ (millions)	% of total	U.S.$ (millions)	% of total	U.S.$ (millions)	% of total
ASSETS						
Current assets	67 480	25	93 160	24	91 930	22
Fixed assets	159 510	60	235 670	60	247 370	60
Flight equipment	120 540	45	182 300	46	196 120	48
Ground property and equipment	24 760	9	33 300	8	33 600	8
Land	2 110	1	4 140	1	4 350	1
Investments in affiliated companies	12 100	5	15 930	4	13 300	3
Other assets	39 610	15	65 720	17	72 300	18
TOTAL ASSETS	266 600	100	394 550	100	411 600	100
LIABILITIES						
Current liabilities	82 990	31	107 530	27	111 340	27
Current liabilities	67 960	25	85 570	22	88 070	21
Unearned transportation revenues	15 030	6	21 960	6	23 270	6
Long-/medium-term liabilities	143 440	54	191 310	48	202 550	49
Long-term debt	93 110	35	125 250	32	129 980	32
Other medium-/long-term liabilities	50 330	19	66 060	17	72 570	18
Stockholders' equity	40 170	15	95 710	24	97 710	24
Share capital	19 780	7	25 040	6	24 360	6
Other capital	20 390	8	70 670	18	73 350	18
TOTAL LIABILITIES	266 600	100	394 550	100	411 600	100
ACCUMULATED DEPRECIATION						
Flight equipment	77 260	76	106 720	76	109 580	75
Ground property and equipment	24 800	24	34 240	24	37 130	25
TOTAL ACCUMULATED DEPRECIATION	102 060	100	140 960	100	146 710	100

1. Excludes domestic operations within the CIS for 1992.

Source: ICAO Air Transport Reporting Form EF-1.

2.88 As regards liabilities, between 1992 and 2000 there was a reduction in the proportion of current liabilities, including unearned transportation revenue (from 31 to 27 per cent of total liabilities), long-term debt (from 35 to 32 per cent), a significant increase in stockholders' equity (from 15 to 24 per cent), advances from affiliated companies, and other liabilities. With regard to stockholders' equity, the increase in relative terms was mostly due to the bigger net balance of unappropriated retained earnings (i.e. cumulative profit) at the end of fiscal year 2000.

Chapter 3
Airports and Air Navigation Services

3.1 This chapter discusses developments in 2001 in the management and organization of airports and air navigation facilities and services, with regard to infrastructure, traffic and financing of airports, and focuses on basic financial and technical aspects of air navigation services.

MANAGEMENT AND ORGANIZATION

Airports

3.2 The establishment of autonomous authorities to operate airports continued in 2001, though at a slower pace than in the previous years, together with private participation in airport operations, management and financing. The interest shown over recent years by some airports and private airport management companies of the developed world in various airport privatization projects in other regions also continued. The events of 11 September 2001 and their impact on civil aviation in the ensuing months took their toll in the form of deferment of some privatization projects, actions being taken with regard to the level of airport and air navigation services charges, and establishment of new or increased levies to cover increased costs of security. Limited activity was reported in 2001 as regards airport alliances; however, the Aeroporti di Roma (Italy) joined the Pantares alliance whose founding members are Amsterdam and Frankfurt airports.

3.3 Secondary airports, located either in the vicinity of large conurbations, or in provincial cities, continued to attract increasing traffic from low-cost carriers. This phenomenon resulted in these airports often experiencing positive gains in traffic results while bigger airports saw their activity declining because of the general downturn linked to the aftermath of the 11 September events.

3.4 As to developments at the state level, in the United States the 99-year lease contract for the management of Niagara Falls Airport (New York) that had been awarded to the Spanish infrastructure management company, Cintra, under the privatization pilot project of the FAA, was terminated; the management contract that had been awarded to BAA plc at Harrisburg Airport (Pennsylvania) was terminated as well. Change of airport ownership leading to increased private involvement occurred in Europe at Klagenfurt (Austria), Bruxelles (Belgium), Frankfurt (Germany), Belfast City, Bournemouth, East Midlands, Glasgow-Prestwick, and Newcastle (all United Kingdom). At Zurich (Switzerland), a 50-year operating contract was awarded to Unique, the airport operator, thus giving it increased autonomy. Privatization plans were pursued at Yerevan (Armenia), Prague (Czech Republic)

and Milan (Italy), considered at other European airports such as Catania (Italy), Bratislava (Slovakia) and Ljubljana (Slovenia), while plans for Malta and Amsterdam (Netherlands), were postponed. The creation of a legal entity to manage three of the airports serving Moscow (Russian Federation) was still under consideration. The Civil Aviation Authority of Greece is to be split into a regulatory agency and a commercial company, covering concession activities at airports.

3.5 In Latin America transfer of ownership to local authorities was carried out for the airports of Quito and Guayaquil (Ecuador) as a step towards planned privatization. In Peru a 30-year management contract for Lima airport was awarded to a consortium including Bechtel (United States), Fraport (Germany) and Peruvian interests. In Trinidad a new independent airport authority was created. Privatization was under way for Maringa Airport (Brazil) and under consideration for Bridgetown (Barbados); for four regional airports in Chile; and for Panama City (Panama), while a 30-year management contract that had just been awarded to a consortium including Santiago and Vancouver airports for the management of Montego Bay (Jamaica) was being reconsidered in view of the recent difficulties facing civil aviation.

3.6 In Africa, a 25-year contract was awarded to Vancouver Airport (Canada) for the management of Sharm-el-Sheikh, and a 40-year concession was awarded to a consortium including Egyptian and Kuwaiti interests and Aéroports de Paris (France) for the new Mersa Alam/Red Sea Airport (Egypt). Privatization was in progress for Algiers (Algeria) as well as for airports managed by Aéroports de Madagascar, and under consideration in Angola as well as for four major airports in Nigeria. In South Africa the listing on the stock exchange of shares of the Airport Company South Africa was postponed to 2004. In the Middle East, a 25-year concession for the management of Muscat and Salalah airports (Oman) was awarded to a consortium involving the British Airport Authority (BAA plc), together with local interest groups. Privitization was also being applied for Larnaca and Paphos airports (Cyprus) and under consideration for Beirut (Lebanon). In Asia and the Pacific, change of ownership occurred not only for some Australian airports (including Darwin and Perth), where BAA plc acquired shares sold by the British group TBI, but also for Qingdao (China), and in Kyrgystan, where a new joint-stock company supervising all airports was established. Change of ownership was under way for: Guangzhou (China), Malaysian airports managed by Malaysia Airport Holdings Bhd (MAHB), where Amsterdam airport was negotiating to acquire 30 per cent of the shares, and Auckland (New Zealand), where Singapore airport was considering increasing its participation in the ownership. Privatization was being considered for another four airports in China, for Tokyo-Haneda (Japan), for Port-Moresby (Papua New Guinea), for Singapore, and for Colombo (Sri Lanka), while the sale of Sydney (Australia) was deferred to 2002.

Air navigation services

3.7 There was limited activity on the transfer of the provision of air navigation services from government departments to autonomous entities in 2001. The privatization of National Air Traffic Services (NATS) in the United Kingdom finally took place in early 2001, followed a few months later by a controversial request made by NATS for government assistance, in view of the less-than-expected revenues owing to reduced air transport activity.

MAJOR AIRPORT PROJECTS

3.8 ICAO regional air navigation plans listed 1 195 airports in the world at the end of 2001 as being open to international civil aviation. At the global level, projects completed, under construction or projected in 2001 that were aimed at providing more capacity at major airports were reported in 82 States and covered 223 airports. The majority of these projects (75 per cent) were concentrated in three regions. By number, nearly half of the projects were reported in Europe, involving 101 airports in 29 States. Ranking second came Asia, where projects were reported for 34 airports in 15 States. Projects in North America involved 32 airports in two States. Other regions of the world combined had projects involving 56 airports in 36 States. The majority of the projects were aimed at increasing passenger capacity by adding new terminals (107 projects) or expanding existing terminals (94 projects). As in the previous year, 20 projects were under way to establish rail links between airports and the cities they serve or to connect airports with the rail network at large.

3.9 During the year, the new major greenfield airports of Athens-Spata (Elefterios Venizelou) (Greece) and Seoul-Incheon (Republic of Korea) became operational, as did regional airports at Chittagong (Bangladesh) and Mersa Alam (Egypt). Work was nearing completion on major projects at Tehran-Imam Khomeini (Islamic Republic of Iran) and at Praia (Cape Verde), as well as on regional airports at Cayo Coco (Cuba), El Alamein (Egypt), Davao (Philippines) and Nelspruit-Mpulamanga/Kruger Park (South Africa), with the opening of all these new airports planned for 2002. Work started or continued on major new airport projects (planned completion dates shown in brackets) at Guangzhou-Huadu, China (2003); Bangalore, India (2005); Nagoya-Chubu, Japan (2005); Yangon-Hanthawady, Myanmar (2005); and Bangkok-Suvarnabhumi, Thailand (2005). Plans were also announced or continued to be studied for new international airports to serve the following cities: a third airport for Paris (France), where a site was selected at Chaulnes, about 125 km north of the city; Berlin-Brandenburg (Germany); Goa, Hyderabad and Mumbai (India); Astana and Almaty (Kazakhstan); Vientiane (Laos); Mexico-Texcoco and Tijuana (Mexico); Lisbon-Ota (Portugal); and Chicago-Peotone (United States). However, the idea of a second airport for Cairo (Egypt) was delayed. With regard to secondary airports serving international traffic between regional centres, plans were also announced for the following new international airport developments: Montserrat (Antilles); Ollombo (Congo); Aarhus (Denmark); Arroyo Barril (Dominican Republic); Abu Simbel and Hurghada (Egypt); Medan and Padang (Indonesia); Eilat (Israel); Lumbini (Nepal); Lublin (Poland); Durban-La Mercy (South Africa); and Panama City, Florida (United States).

3.10 Major airport expansion projects were under way in all regions in 2001, although concentrated, as noted above, in Europe, Asia and North America. New passenger terminals were completed during the year, notably at the airports of Urumqi (China); Abidjan (Côte d'Ivoire); Dresden, Munster and Paderborn (Germany); Manado (Indonesia); Cape Town (South Africa); Belfast City (United Kingdom); Chicago-Midway, Fort Lauderdale, New York-Kennedy (JFK) and Orlando (United States); Hanoi (Viet Nam); and Harare (Zimbabwe). Significant passenger terminal expansions were completed, notably at Dhaka (Bangladesh); Bordeaux, Paris-Charles de Gaulle and Toulouse (France); Basel/Mulhouse (France/Switzerland); Pointe-à-Pitre (French Antilles); Duesseldorf (Germany); Riga (Latvia); Rotterdam (Netherlands); Krakow (Poland); Apia (Samoa); Cardiff, Edinburgh and London-Gatwick

(United Kingdom); and New York-Newark (United States). New terminals or significant passenger terminal expansion works were under construction at about 80 major airports all around the world: notably at Buenos Aires (Argentina); Vienna (Austria); Bridgetown (Barbados); Porto Alegre (Brazil); Phnom Penh (Cambodia); Ottawa and Toronto (Canada); Chengdu, Chongqing, Lhasa and Shenyang (China); Prague (Czech Republic); Billund (Denmark); Addis Ababa (Ethiopia); Caen, Nice, Rennes and Toulouse (France); Leipzig and Munich (Germany); Chania (Greece); Jaipur (India); Tel Aviv (Israel); Cagliari (Italy); Almaty (Kazakhstan); St. Martin (Netherlands Antilles); Lagos (Nigeria); Manila (Philippines); Moscow-Domodedovo (Russian Federation); Capetown and Johannesburg (South Africa); Madrid (Spain); Bern (Switzerland); Detroit, Hartford, Miami and Philadelphia (United States). In addition, a number of expansion or new terminal projects were planned for another 130 major airports around the world. As a direct consequence of the 11 September events and the ensuing slowdown in traffic, some airports announced the postponement of the opening of new terminals: Tel Aviv (Israel); Singapore; and Stockholm (Sweden); while extension projects at Charlotte and Honolulu (United States) were deferred.

3.11 In 2001, runway capacity was added at Paris-Charles de Gaulle (France); Stockholm-Arlanda (Sweden); Kiev (Ukraine); Manchester (United Kingdom); and Detroit (United States), with additions under construction at Toronto-Lester B. Pearson (Canada); Shanghai-Pudong (China); Helsinki (Finland); Heraklion (Greece); Osaka-Kansai and Tokyo-Narita (Japan); Amsterdam (Netherlands); Kazan (Russian Federation); and Miami (United States). A number of new runway projects have been announced, notably at Casablanca (Morocco); Lima (Peru); Barcelona and Madrid (Spain); and Atlanta, San José, Seattle and St. Louis (United States). Another thirty-some runway extension projects are under way or planned. Addition of a new runway was postponed at Charlotte (United States).

AIRPORT TRAFFIC

3.12 The 25 largest airports in the world in terms of passenger throughput, 15 of which are located in the United States, handled a combined total of about 1 030 million passengers in 2001, registering a decline of 4.5 per cent as compared to the traffic for 2000 (Table 3-1). This represents about 33 per cent of the world total of scheduled and non-scheduled passengers or an average per airport of some 113 000 passengers every twenty-four hours. These 25 airports also handled a combined total of just over 10.9 million aircraft movements in 2001, corresponding to an average per airport of one take-off or landing every 73 seconds. Aircraft movement traffic declined by 5.5 per cent compared with 2000. All 15 United States airports registered a decline in traffic.

3.13 There are significant differences between the rankings of airports by passengers and by movements. For example, Tokyo-Haneda ranks fifth in terms of passengers handled but 44th in terms of aircraft movements, Hong Kong is 17th by passengers but 57th by movements, London Gatwick is 20th by passengers but 46th by movements, and Bangkok is 23rd by passengers but 65th by movements, illustrating that a substantial part of traffic at these airports is carried on wide-body aircraft. Airports that do not make the listing by passengers

but would make a top 25 listing by movements are St. Louis (10), Pittsburgh (14), Boston (15), Charlotte (19), Philadelphia (20), Seattle (21) and Cincinnati (24) in the United States.

3.14 Table 3-1 also includes 1992 data to illustrate the longer-term rate of growth of airport traffic. The number of passengers handled at the large airports concerned increased at about 3.9 per cent per annum on average over the 1992–2001 period, while aircraft movements increased at some 2.1 per cent per annum, illustrating a trend towards the use of larger aircraft. There were substantial differences in the rates of growth among individual airports.

3.15 Table 3-2 lists the 25 largest airports in the world in terms of international passengers handled. In marked contrast to Table 3-1, only three of the 25 airports are located in the United States. The 25 airports together, representing about 2 per cent of airports serving international operations, handled about 557 million passengers in 2001, or about 52 per cent of the world total of international scheduled and non-scheduled passengers. In 2001, the total international passenger traffic of the 25 airports witnessed a marginal decline of 0.3 per cent, and the total international aircraft movement registered growth of 1.2 per cent over the year 2000. Airports that witnessed a significant decline of international passenger traffic are Tokyo-Narita (–11.6 per cent), New York-Kennedy (–10.5 per cent) and Milan-Malpensa (–10.4 per cent).

3.16 Over the 1992–2001 period, the number of international passengers handled at these airports increased at a rate of about 5.9 per cent per annum, and the number of international aircraft movements increased at about 5.3 per cent per annum. Over this period, the highest annual growth rates in terms of individual passenger traffic were recorded for Milan-Malpensa (19.7 per cent) and Dublin (11 per cent). Milan-Malpensa also achieved the highest annual growth rate in terms of international aircraft movements (about 22.4 per cent) followed by Munich (8.4 per cent).

AIRPORT FINANCES

3.17 Until September 2001 the financial situation of international airports had continued to improve on an annual basis for many years. More and more airports worldwide are 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 civil aviation still do 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 being major contributing factors. The proportion of income from non-aeronautical sources has continued to increase to become the main source of income (more than 50 per cent) for major airports in Europe and North America as well as the Middle East, and Asia and the Pacific. As in previous years, airports with high traffic volumes generally show higher shares of non-aeronautical revenues and the share tends to increase as traffic increases.

3.18 However, the events of September 2001 had a negative impact on the finances of many airports and significant financial implications for some of them. In particular the loss

of revenues from charges on air traffic and non-aeronautical sources affected balance sheets. An immediate impact for many airports was the additional cost of security measures and insurance coverage. The long-term financial impact of the downturn in revenues towards the end of 2001 will be governed largely by the pace of recovery of traffic.

3.19 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 4.1 per cent in 2000 (preliminary data), partly reflecting an increase in costs for aircraft fuel and oil.

AIR NAVIGATION FACILITIES AND SERVICES

3.20 The financial situation of air navigation services also continued to improve through most of 2001, particularly where they were operated by autonomous authorities. The improvement has been worldwide and is 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 has been the increase in the number of States levying approach and aerodrome control charges. However, many States are still not including all their air navigation services costs in the cost basis for charges, notably the costs of meteorological services, nor are they allowing for depreciation and/or amortization in establishing the cost basis, thereby forfeiting an opportunity to build reserves for facility renewal and expansion. 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.

3.21 Towards the end of 2001, a number of air navigation services providers experienced similar effects as airports in terms of loss of revenues from air navigation services charges due to reductions in air traffic and aircraft movements.

3.22 The share which route facility charges represent of total airline operating expenses increased through most of the 1990s, from 2.0 per cent in 1990 to a peak of 3.0 per cent in 1998. Most of the increase occurred in the first half of the period and 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 had been reduced to 2.9 per cent in 1999 and, according to preliminary data, 2.6 per cent in 2000. The lower value for 2000 is partly explained by an increase in aircraft fuel and oil costs.

Communications, navigation and surveillance

3.23 Implementation of communications, navigation, surveillance/air traffic management (CNS/ATM) systems continued. Communications via data link continued to be used for

Table 3-1. Scheduled and non-scheduled traffic at world's major airports — 2001 and 2000 (top 25 airports ranked by TOTAL passengers)

Rank No.	Airport (ranking by total commercial aircraft movements given in brackets)	Passengers embarked and disembarked				Aircraft movements			
		2001[1] (thousands)	2000 (thousands)	Change 2001/2000 (%)	Average change per annum 2001/1992 (%)	2001[1] (thousands)	2000 (thousands)	Change 2001/2000 (%)	Average change per annum 2001/1992 (%)
1	Atlanta (1)	75 503	79 832	-5.4	6.7	776.0	891.3	-12.9	3.0
2	Chicago (3)	67 007	71 657	-6.5	0.4	749.9	872.8	-14.1	-1.0
3	Los Angeles (4)	60 781	65 546	-7.3	2.9	719.9	764.1	-5.8	2.0
4	London-Heathrow (9)	60 454	64 279	-6.0	3.3	457.6	460.5	-0.6	1.8
5	Tokyo-Haneda (44)	58 669	56 379	4.1	3.6	262.0	249.0	5.2	3.9
6	Dallas/Ft. Worth (2)	54 901	60 412	-9.1	0.6	770.6	822.2	-6.3	0.3
7	Frankfurt (11)	48 261	48 965	-1.4	5.4	449.0	446.6	0.5	3.7
8	Paris-Charles de Gaulle (5)	47 930	47 801	0.3	7.6	515.1	508.6	1.3	6.6
9	Amsterdam (18)	39 309	39 271	0.1	8.6	416.5	414.9	0.4	6.4
10	Denver (6)	36 093	38 752	-6.9	1.7	491.6	504.3	-2.5	0.5
11	Phoenix (7)	35 439	36 040	-1.7	5.4	488.7	503.6	-3.0	3.0
12	Las Vegas (29)	35 181	36 866	-4.6	5.9	322.5	394.3	-18.2	0.9
13	Minneapolis (13)	35 171	36 752	-4.3	4.9	442.1	462.6	-4.4	2.5
14	Houston (12)	34 795	35 251	-1.3	6.7	448.7	460.7	-2.6	5.5
15	San Francisco (25)	33 944	40 280	-15.7	0.7	367.5	401.2	-8.4	-0.5
16	Madrid (23)	33 778	32 566	3.7	7.2	371.2	350.3	6.0	8.3
17	Hong Kong (57)	32 685	32 131	1.7	4.5	196.7	182.0	8.1	5.8
18	Detroit (8)	32 294	35 535	-9.1	3.9	458.7	488.0	-6.0	2.3
19	Miami (17)	31 668	33 621	-5.8	2.0	417.0	447.8	-6.9	0.3
20	London-Gatwick (46)	31 097	31 949	-2.7	5.1	244.1	252.8	-3.4	3.7
21	New York-Newark (16)	30 500	34 188	-10.8	2.6	417.3	430.4	-3.0	0.8
22	New York-Kennedy (37)	29 400	32 856	-10.5	0.6	281.1	331.8	-15.3	-0.9
23	Bangkok (65)	28 808	28 323	1.7	7.6	187.3	182.7	2.5	4.3
24	Orlando (36)	28 251	30 824	-8.3	3.3	283.4	322.7	-12.2	0.3
25	Toronto (22)	28 043	28 930	-3.1	5.1	371.4	389.7	-4.7	2.2
	TOTAL	1 029 962	1 079 006	-4.5	3.9	10 905.9	11 534.9	-5.5	2.1

1. 2001 data are still preliminary; actual ranking and percentage change may differ when final data become available.

Source: ICAO Air Transport Reporting Form I, ACI and other sources.

Table 3-2. Scheduled and non-scheduled traffic at world's major airports — 2001 and 2000 (top 25 airports ranked by INTERNATIONAL passengers)

Rank No.	Airport (ranking by international commercial aircraft movements given in brackets)	International passengers embarked and disembarked				International aircraft movements			
		2001[1] (thousands)	2000 (thousands)	Change 2001/2000 (%)	Average change per annum 2001/1992 (%)	2001[1] (thousands)	2000 (thousands)	Change 2001/2000 (%)	Average change per annum 2001/1992 (%)
1	London-Heathrow (3)	53 820	56 875	-5.4	3.9	394.6	393.3	0.3	2.8
2	Paris-Charles de Gaulle (1)	42 859	42 506	0.8	7.5	450.0	447.5	0.6	6.4
3	Frankfurt (4)	39 922	40 282	-0.9	6.2	352.7	353.6	-0.3	4.1
4	Amsterdam-Schiphol (2)	39 139	40 196	-2.6	8.6	408.6	407.0	0.4	6.5
5	Hong Kong (10)	32 685	32 131	1.7	4.5	196.6	181.9	8.1	5.5
6	London-Gatwick (9)	28 117	29 037	-3.2	4.6	200.0	210.6	-5.0	3.2
7	Singapore (15)	25 552	26 963	-5.2	4.7	179.0	173.9	2.9	4.0
8	Bangkok (20)	21 395	20 966	2.0	7.4	132.3	126.7	4.4	4.0
9	Tokyo-Narita (24)	21 241	24 022	-11.6	1.2	124.5	126.8	-1.8	0.9
10	Zurich (6)	19 700	21 192	-7.0	5.7	255.1	263.0	-3.0	4.5
11	Brussels (5)	19 652	21 515	-8.7	8.7	268.9	287.0	-6.3	4.5
12	Madrid (13)	17 060	16 049	6.3	8.1	179.7	167.8	7.1	7.1
13	New York-Kennedy (28)	16 688	18 646	-10.5	1.1	108.0	120.0	-10.0	1.6
14	Taipei (25)	16 443	16 705	-1.6	4.8	123.9	114.0	8.7	7.3
15	Copenhagen (7)	16 279	16 173	0.7	5.9	246.9	247.0	-0.0	5.0
16	Manchester (21)	16 259	15 485	5.0	5.8	131.0	128.6	1.9	4.4
17	Toronto (11)	16 114	16 612	-3.0	6.0	191.7	201.0	-4.6	4.5
18	Miami (12)	15 249	16 180	-5.8	3.2	186.2	206.0	-9.6	4.5
19	Los Angeles (29)	15 121	16 574	-8.8	3.1	106.4	113.0	-5.8	5.5
20	Munich (8)	14 936	14 600	2.3	8.2	205.4	194.1	5.8	8.4
21	Palma de Mallorca (35)	14 318	14 461	-1.0	6.3	89.4	96.2	-7.1	5.7
22	Seoul-Incheon (40)[2]	14 279	—	—	—	84.2	—	—	—
23	Milan-Malpensa (14)	13 537	15 109	-10.4	19.7	179.4	179.4	0.0	22.4
24	Dublin (18)	13 460	13 030	3.3	10.8	153.5	149.0	3.0	7.4
25	Rome-Fiumicino (22)	13 289	13 446	-1.2	3.4	131.0	130.4	0.5	4.1
	TOTAL	557 114	558 755	-0.3	5.9	5 079	5 018	1.2	5.3

1. 2001 data are still preliminary; actual ranking and percentage change may differ when final data become available.
2. The new Seoul airport, Incheon International, opened on 30 March 2001.

Source: ICAO Air Transport Reporting Form I, ACI and other sources.

transmission of ATM-related information, for example, for the delivery of oceanic clearances, pre-departure clearances and weather information. Significant technical and operational experience had been gained through trials and implementation of interim CNS/ATM systems. Past performance of controller-pilot data link communications (CPDLC) and automatic dependent surveillance (ADS) systems in oceanic airspace had proven their suitability for application with the initial objective of replacing high frequency voice communications. Programmes which had started in Europe and the United States to implement CPDLC were affected by the events of 11 September 2001; as a result, the initial milestones of the programmes had to be delayed significantly.

3.24 Work continued in a number of States and international organizations, with industry input, on developing certifiable aeronautical telecommunication network subsystems. In particular, the message handling service for air traffic services has been implemented in Spain and Thailand (for domestic use) and is being actively developed for operational use in Asia, Europe, Japan and the United States. Work also continued on the development and assessment of digital technologies to improve very high frequency communication spectrum utilization.

3.25 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 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) and for a new civil satellite navigation system to be developed in Europe, known as Galileo (not identical to the CRS service provider also named Galileo, cf. paragraph 2.44).

3.26 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 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.

3.27 A number of multinational facilities and services have been developed in line with ICAO worldwide provisions. Some of these, such as the world area forecast centres in London and Washington and 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.

3.28 During 2001 preparations for the International Telecommunication Union World Radiocommunication Conference (2003) (WRC-2003) continued. Particular emphasis was placed on the protection of the aeronautical spectrum used for radio navigation systems. The ICAO position for WRC-2003 was approved by the Council in 2001 and sent to all Contracting States and relevant international organizations for their consideration when preparing their own positions.

Air traffic management

3.29 Air traffic control systems around the world continued to be updated as part of the evolutionary process leading to a seamless and fully integrated global 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. The expansive airspace over Siberia in the Russian Federation airspace, including the polar regions, became increasingly available for international civil aviation due to the implementation of CNS/ATM functionalities into air traffic services (ATS) systems. In particular, CPDLC and ADS allowed for more efficient communications and surveillance in remote airspaces. Significant progress was made toward implementation of a series of ATS transit routes across the Arctic and northern regions of the earth. This progress has been made possible through the combined efforts of the States that control this airspace and ICAO's development of comprehensive SARPs specifically directed at ADS and CPDLC operations, which will support their uniform application worldwide.

3.30 Several ATM operational concepts, aimed at the progressive introduction of CNS technologies in support of seamless ATM systems, have been developed. The organizations developing these concepts continued to closely cooperate toward a coordinated implementation of ATM systems. In 2001, the ICAO Air Traffic Management Operational Concept Panel made significant progress toward the development of a global ATM operational concept for implementation of CNS/ATM systems. The first version of this operational concept will be available in 2002 for review by ICAO's Air Navigation Commission.

3.31 Progress continued with implementation of required navigation performance (RNP) airspace and the introduction of reduced separation minima based on RNP. RNP 5 was introduced on a limited number of routes in the Middle East in March 2001, and RNP 10 was introduced in the South Atlantic in October 2001. Development of standards and procedures for reduced separation minima continued. New separation minima for use in RNP 4 airspace and new lateral separation minima for crossing traffic in oceanic airspace were developed and will become applicable in November 2002.

3.32 Reduced vertical separation minimum (RVSM) was implemented in the Western Atlantic Route System in November 2001. The implementation of RVSM airspace in Western Europe and the major Europe–South America routes is planned for January 2002. RVSM airspace in the North Atlantic is to be extended at the same time to encompass all levels from FL 290 to FL 410. An extension of Pacific RVSM airspace to the Western Pacific and South-east Asia airspace is to be implemented in February 2002. Planning is under way for the introduction of RVSM in Canada, the United States and the Middle East.

Aerodromes

3.33 An ICAO study progressed 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). The impact of these very heavy aeroplanes on airport pavements is being studied concurrently with two full-scale pavement testing projects in two States. 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, continues to be studied. The emergency evacuation times of future larger aeroplanes is another issue that needs further study. Studies for identifying a suitable alternative to halons (halogenated hydrocarbons) as a complementary fire extinguishing agent are ongoing. Improved specifications were introduced on rescue and fire fighting, particularly on rescue in water and difficult terrain, and emergency response times within the airport boundary.

3.34 Based on studies and trials undertaken in States, ICAO specifications on visual aids for navigation were updated to reflect current technology. Further studies are under way. To ensure operational safety at airports, specifications on frangibility were also revised.

3.35 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 would need to have appropriate legislation and regulations in place to be able to carry out safety inspections for ensuring 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* has been published to help States meet their obligations under the Convention on International Civil Aviation.

Aeronautical information and charts services

3.36 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.

3.37 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 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.

3.38 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 continued the development of recommendations for a future standardized aeronautical information conceptual model that would ensure sharing and exchanging of aeronautical information. 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 to be continued until April 2002. The prototype system, to be called Aeronautical Data Package (ADP), is designed to prove the capability of maintaining aeronautical information of all Contracting States 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.

3.39 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. Bearing in mind that one 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

3.40 An increasing use of improved automatic weather observing systems for general meteorological observations in States 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 to support measures being taken 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.

3.41 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 to receive data and products from the three ICAO satellite broadcasts were installed in almost 140 States. These broadcasts provide global WAFS data, products and operational meteorological information directly to States. The

implementation of the satellite broadcasts and the provision of SIGWX forecasts by the WAFCs have permitted the closure of 13 of the 15 regional area forecast centres (RAFCs), and transition plans for the phased transfer of responsibilities from the remaining RAFCs to the WAFCs were implemented in the regions concerned.

3.42 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

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

3.44 The system continued to expand its capability. There were six low-altitude and three geostationary satellites (plus three in-orbit spares) in operation. At year's end, 39 local user terminals (LUTs) and 23 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. The Council of the European Organisation for the Exploitation of Meteorological Satellites has agreed to accommodate 406 MHz search and rescue transponders on 3 geostationary satellites, the first of which is scheduled for launch in 2002.

3.45 Since it began trial operations in September 1982, the COSPAS-SARSAT system has contributed to the rescue of over 12 800 persons in over 3 740 aeronautical, maritime and terrestrial SAR events.

Controlled flight into terrain (CFIT)

3.46 Amendments to Annex 3 — *Meteorological Service for International Air Navigation*, adopted in 2001, require QNH[2] and QFE[3] to be provided in four digits to reduce the possibility of confusion between the different units used by States for atmospheric pressure values. Amendments to Annex 3 and Annex 11 — *Air Traffic Services* to expand requirements for the provision of runway visual range information were adopted in 2001. Amendments to Annex 4, adopted in 2001, require terrain contours, with layer tinting printed in brown, on instrument

1. COSPAS — Space system for search of vessels in distress;
   SARSAT — Search and rescue satellite-aided tracking.
2. Altimeter subscale setting to obtain elevation when on the ground.
3. Atmospheric pressure at aerodrome elevation.

approach charts for aerodromes affected by higher terrain. Recommended Practices cover other aerodromes, where the terrain is not considered a problem, and the provision of terrain contours on Area Charts, the Standard Departure Chart and the Standard Arrival Chart. Amendments to Annex 6 — *Operation of Aircraft*, Parts I, II and III, adopted in 2001, revised the definitions for aerodrome/heliport operating minima, decision altitude or decision height and instrument approach and landing operations using instrument approach procedures, to allow for the addition of a definition for "approach and landing with vertical guidance".

3.47 Amendments to the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS), approved in 2001, included for Volume I, material on: RNAV departure procedures for basic GNSS receivers; revision of the RNAV approach procedures for basic GNSS receivers; new instrument approach procedures for RNAV/barometric vertical navigation (RNAV/baro-VNAV); constant approach slopes and maximum and minimum descents on reversal procedures; and altimeter corrections, specifically for pressure, temperature and mountainous terrain, both en-route and in the terminal area. Other material incorporated in Volume I provides procedures for the stabilized approach, standard operating procedures, the design and use of checklists, and flight crew briefings for departure and arrival. Amendments to PANS-OPS, Volume II, included instrument approach procedures for RNAV/baro-VNAV. Amendments to the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM) approved in 2001 included a revision of phraseology for radiotelephony.

3.48 Proposed amendments scheduled for applicability starting in 2002 include: a) provision of electronic terrain data, proposals for a terminal area radar vector chart and for the Aerodrome Obstacle Chart — ICAO Type C in electronic format (Annexes 4 and 15); b) requirements for ground proximity warning systems with the forward looking terrain avoidance function which would allow the use of less complex and expensive systems by piston-engined and smaller turbine-engined aeroplanes in commercial operations and by all aeroplanes in general aviation (Annex 6, Parts I and II); and c) enhancement of the RNAV/baro-VNAV instrument approach criteria to provide lower operating minima and introduce SBAS and GBAS criteria supporting GNSS instrument approach procedures for Category I instrument approach and landing operations (PANS-OPS, Volumes I and II).

3.49 The original CFIT prevention material, the *CFIT Education and Training Aid*, published in 1996, has now been replaced by a new *Approach and Landing Accident Reduction (ALAR) Tool Kit*. The *ALAR Tool Kit* has been assessed as containing extremely valuable accident prevention material which will greatly assist accident prevention programmes. It consists of education and training material in the form of briefing notes, PowerPoint presentations, video presentations, and risk assessment and reduction guides, together with extensive reference and background material. All this material can be readily incorporated into personnel training programmes.

Flight safety and Human Factors

3.50 A Regional Seminar on Accident Prevention and Investigation was held in Santa Cruz, Bolivia, from 2 to 6 April 2001. Its programme included one full day dedicated to

Human Factors issues in accident prevention and investigation. The event was attended by representatives from Contracting States from the Caribbean and South America, as well by representatives from industry, training organizations and academia.

3.51 An ICAO Regional Seminar on the Line Operations Safety Audit (LOSA) was held in Panama from 27 to 29 November 2001. LOSA is an emerging methodology to collect safety information by routine monitoring of normal airline operations.

Training

3.52 Since January 2001, four civil aviation training centres have joined the ICAO TRAINAIR Programme, bringing the number of participating centres to 37. Course development activities of TRAINAIR members continued to expand; as of November, 121 Standardized Training Packages (STPs) either have been completed or are under development.

3.53 Four STPs designed to provide skills and knowledge needed by government safety inspectors were developed though a cooperative effort between the FAA and ICAO. A total of nine civil aviation training centres have received their initial assessment to ascertain that they meet the requirements to provide ICAO-endorsed training for government safety inspectors on an international basis using these STPs.

Chapter 4
User and Public Interest

4.1 This chapter reviews the levels of safety and security in air transport in 2001, 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.

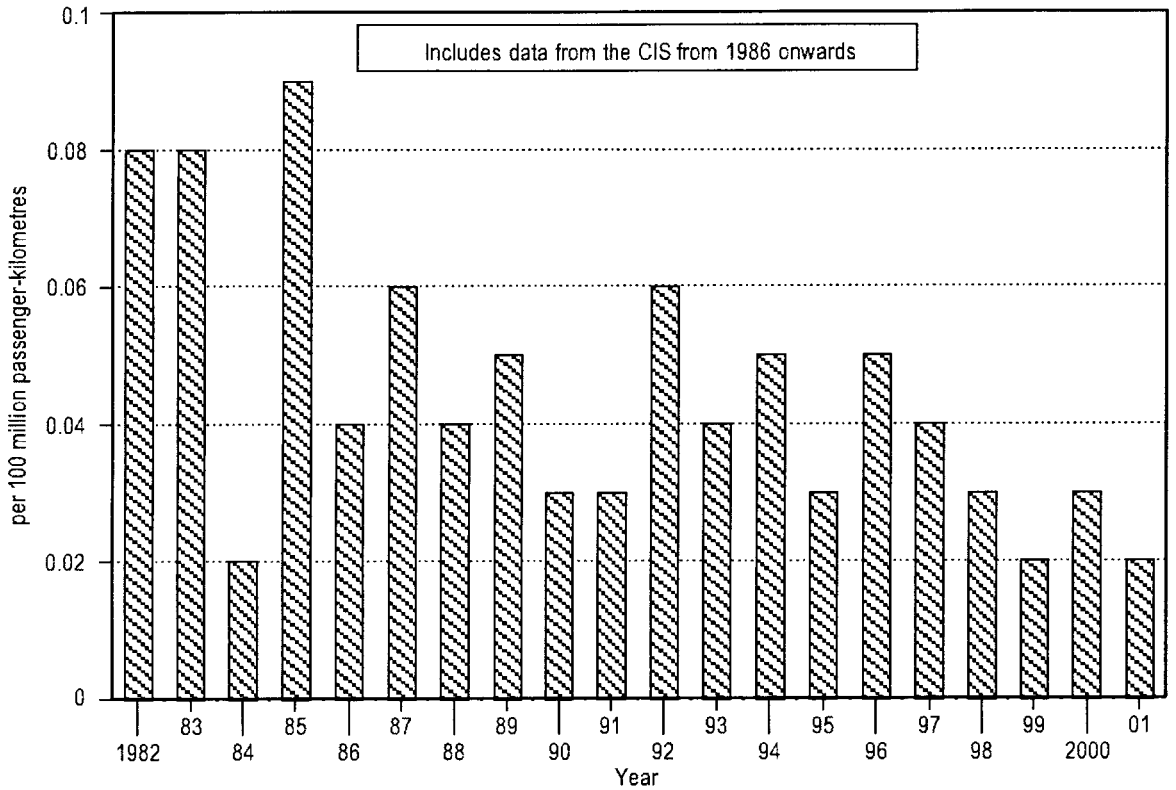
Scheduled operations

4.3 Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services worldwide shows that in 2001 there were 13 aircraft accidents with passenger fatalities involving aircraft with a certificated maximum take-off mass of more than 2 250 kg. The number of passenger fatalities involved was 577. This compares with 18 fatal accidents and 757 passenger fatalities in 2000 (Table A2-3 in Appendix 2). Despite the lower passenger traffic volume carried in 2001, due to the lower number of fatalities the number of passenger fatalities per 100 million passenger-kilometres decreased from 0.025 to 0.02 in 2000. Similarly, the number of fatal aircraft accidents per 100 million aircraft-kilometres flown decreased to 0.05 from 0.07 in 2000, and the number of fatal aircraft accidents per 100 000 landings decreased to 0.06 from 0.09 in 2000 (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 5 accidents in 2001 with 513 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 2 per cent of the scheduled traffic volume, there were 8 accidents with 64 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 (1982–2001)

available to ICAO on the safety of non-scheduled passenger operations show that there were 29 fatal accidents involving aircraft with a maximum certificated take-off mass of more than 2 250 kg in 2001 (including 5 involving aircraft operating all-cargo services with passengers on board) compared with 21 in 2000. These accidents accounted for 204 passenger fatalities in 2001 compared with 290 in 2000.

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 13 fatal accidents with 118 passenger fatalities in 2001.

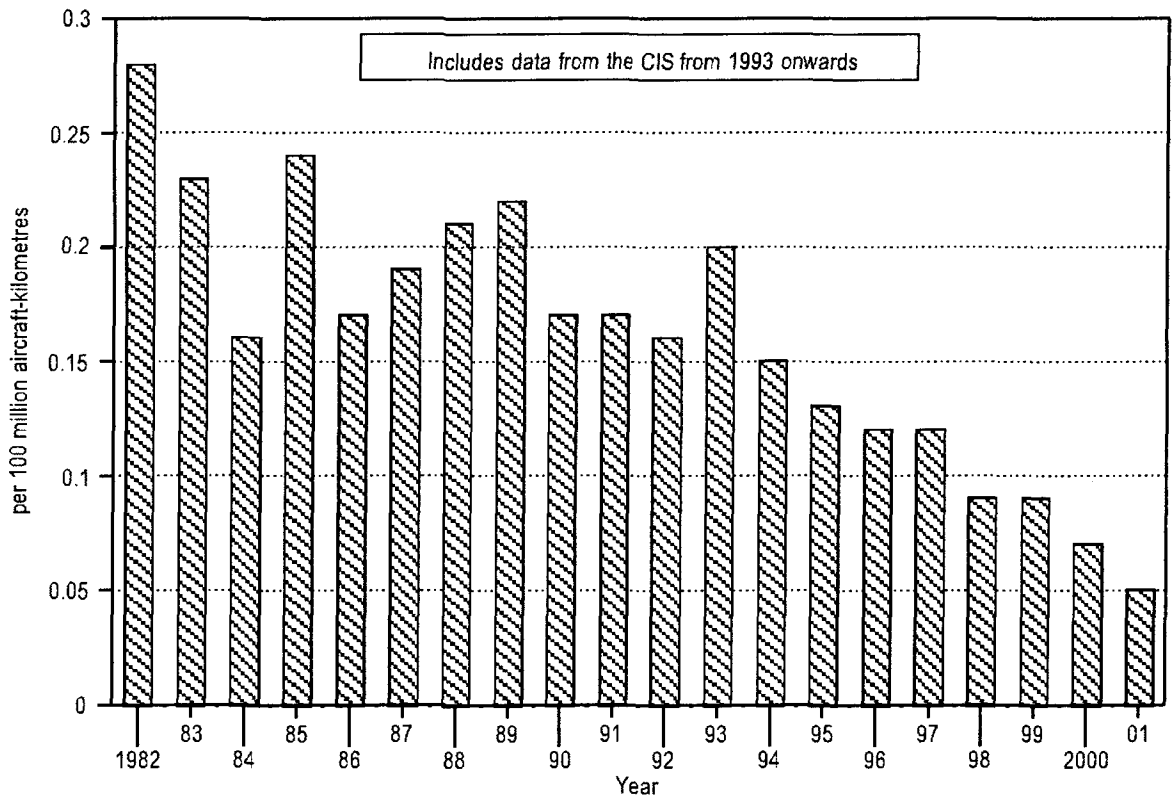
Safety oversight

4.7 The ICAO Universal Safety Oversight Audit Programme, established in 1999, continued its audit activities in 2001. A comprehensive report was presented to the

33rd Session of the Assembly, which recognized the successful implementation of the Programme. By the end of the year, aviation administrations in 178 Contracting States and five territories had been audited.

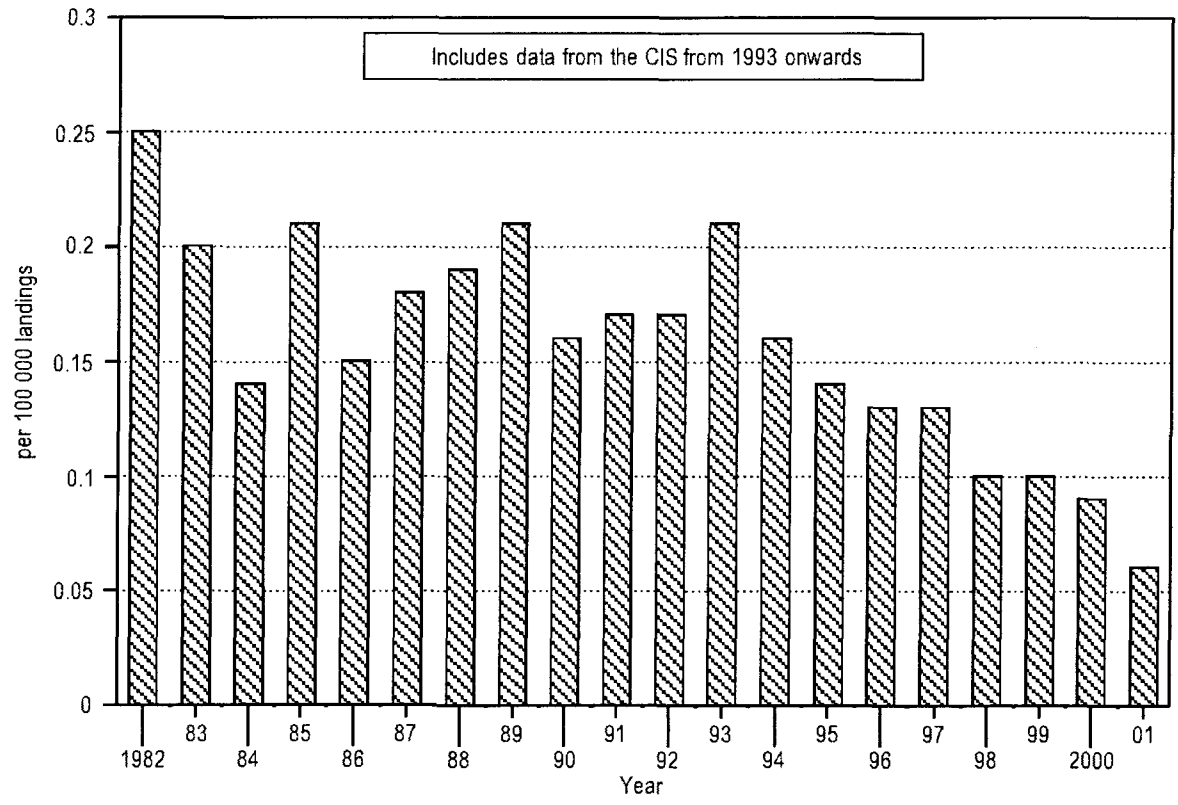
4.8 The Assembly adopted two resolutions which provide, *inter alia*, for the continuation and expansion of the Programme, for the resolution of deficiencies identified through the audits, and for the establishment of a quality assurance function for safety oversight projects.

4.9 The conduct of audit follow-up missions commenced in 2001, with thirty of them completed by the end of the year. The follow-up 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.



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

Figure 4-2. Fatal accidents per 100 million aircraft-kilometres flown on scheduled services (1982-2001)



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

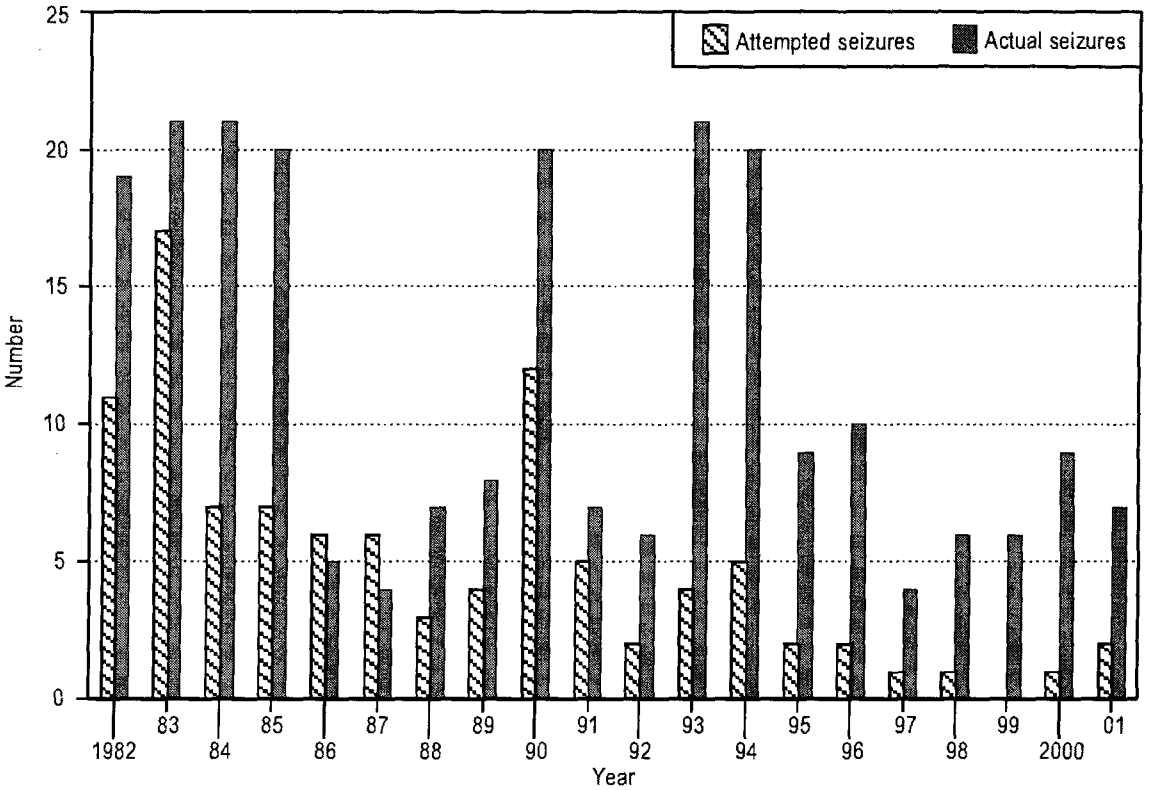
Figure 4-3. Fatal accidents per 100 000 landings by aircraft on scheduled services (1982–2001)

4.10 The analysis conducted through the 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 into 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.

4.11 Preliminary work towards the expansion of the Programme to other technical fields progressed as planned.

SECURITY

4.12 During the reporting period, 21 acts of unlawful interference were recorded (as of the year 2000 these included officially reported acts as well as ones recorded from other sources,



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

Figure 4-4. Acts of unlawful seizure (1982-2001)

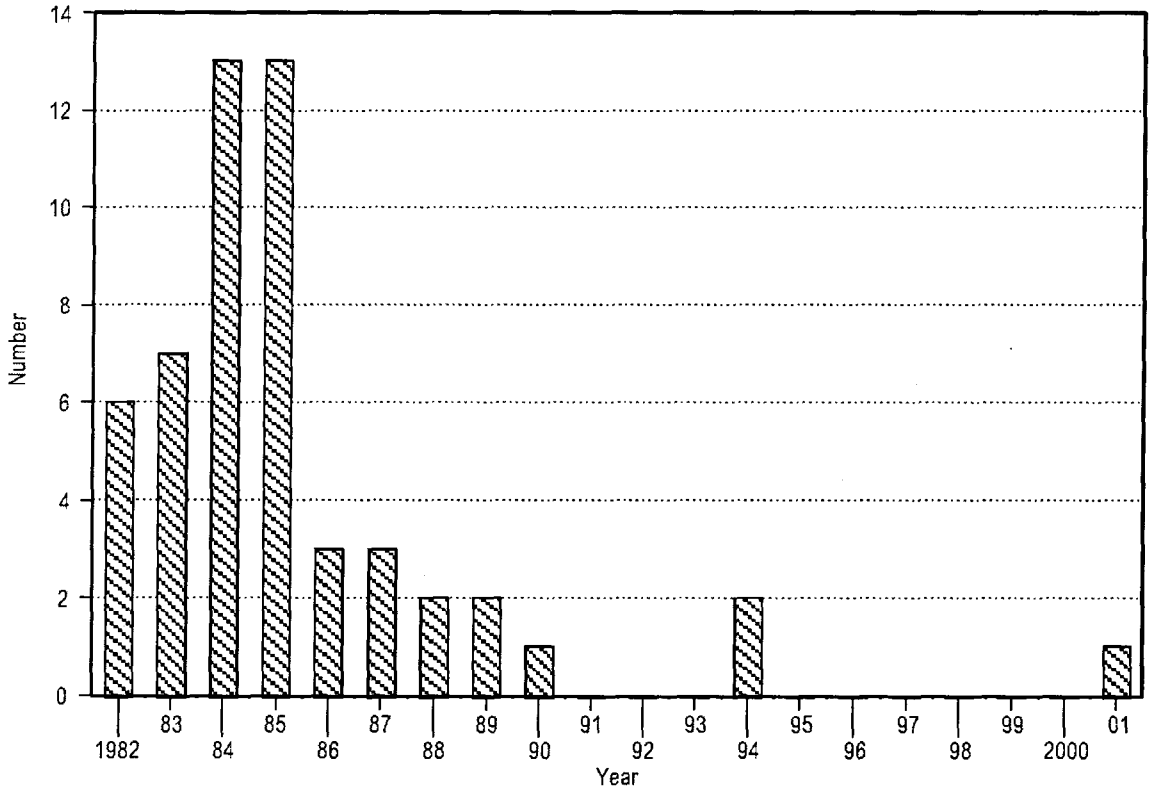
for example media reports). These acts were seven unlawful seizures (including four simultaneous hijackings committed in the United States on 11 September using civil aircraft as weapons of destruction), two attempted seizures, four facility attacks, four attempted facility attacks, two in-flight attacks, one attempted in-flight attack, and one attempted sabotage. Developments in acts of unlawful interference since 1991 are shown in Figures 4-4 to 4-6 and in Appendix 2, Table A2-4.

4.13 Considering the emergency situation following September 2001, and in accordance with Assembly Resolution A33-1, Declaration on misuse of civil aircraft as weapons of destruction and other terrorist acts involving civil aviation, the ICAO Council decided to convene a High-level, Ministerial Conference on Aviation Security on 19 and 20 February 2002 at ICAO Headquarters with the objectives of preventing, combatting and eradicating acts of terrorism involving civil aviation, strengthening ICAO's role in the adoption of security-related SARPs and procedures and the audit of their implementation, and ensuring the necessary financial means for urgent actions by ICAO in the field of aviation security.

4.14 Amendment 10 to Annex 17 — *Security* was adopted by the Council on 7 December 2001. It will become effective on 15 April 2002 and applicable on 1 July 2002. This amendment includes the introduction of various definitions and new provisions in relation to the applicability of this Annex to domestic operations, international cooperation relating to threat information, National Aviation Security Committee, national quality control, access control, passengers and their cabin and hold baggage, in-flight security personnel, protection of the cockpit, codesharing/collaborative arrangements, human factors and management of response to acts of unlawful interference.

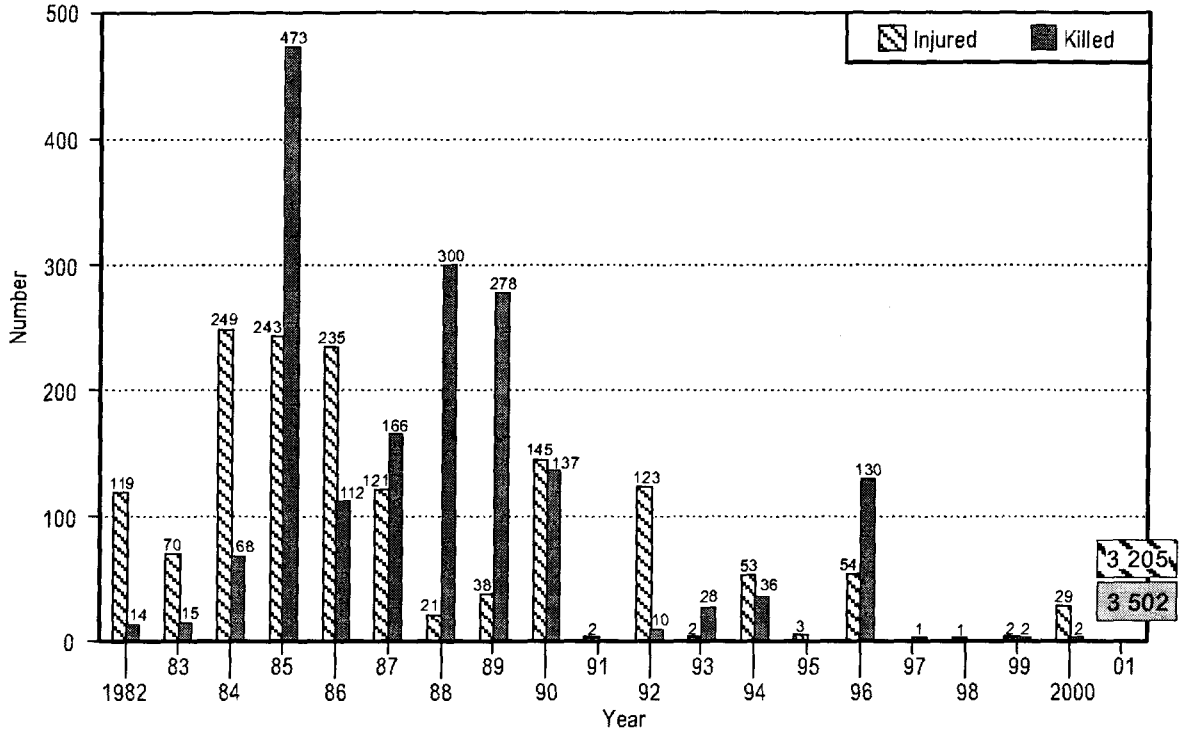
Convention on the Marking of Plastic Explosives

4.15 The ICAO Council approved the International Explosives Technical Commission's (IETC) recommendation to amend the Technical Annex to the *Convention on the Marking of*



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

Figure 4-5. Incidents of sabotage (1982-2001)



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 (1982-2001)

Plastic Explosives for the Purpose of Detection by deleting ortho-Mononitrotoluene (o-MNT) from the list of detection agents. Following consultation with States, the amendment was adopted on 27 September 2001 and will enter into force on 27 March 2002.

AIR CARRIER LIABILITY

Status of ratification of the Montreal Convention of 1999

4.16 The *Convention for the Unification of Certain Rules for International Carriage by Air*, done at Montreal on 28 May 1999, has to date been ratified or otherwise been accepted by the following fourteen States: Bahrain, Barbados, Belize, Botswana, Czech Republic, Japan, Kenya,

Mexico, Namibia, Paraguay, Romania, Slovakia, The former Yugoslav Republic of Macedonia, and United Arab Emirates. Ratification procedures are currently under way in a number of other States. The Convention requires thirty ratifications in order to enter into force.

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 have made such a commitment in the form of financial guarantees and reinsurance facilities, but these arrangements are temporary in nature, vary in scope and implementation and demand 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. A decision regarding the establishment and operation of such an insurance entity is expected to be taken in mid-2002.

FACILITATION

4.20 While airline traffic levels have fallen after the events of 11 September 2001, it may be safely assumed that expansion of airport arrival and departure facilities and the staffing levels of border inspection agencies will not keep pace with the growth of passenger traffic. The problems of illegal migration and smuggling by air are not likely to diminish; on the contrary, they may increase, bringing additional challenges to every State's border control system. States in all regions need to plan and equip themselves to meet these challenges so that border inspection processes do not slow down, exacerbating delays. This issue has become increasingly critical given the need to develop and implement enhanced security measures worldwide in response to the events of 11 September.

4.21 To help States address these challenges, ICAO has updated its specifications for machine readable passports and card-format machine readable official travel documents (MRTDs), offering an unprecedented level of security against travel document fraud. Approximately 100 Contracting States either issue machine readable passports currently or plan to do so in the near future. The next step is for States to adopt the use of reading machines at airports in order to take full advantage of the "global interoperability" of these documents.

4.22 Reading machines, linked to systems to capture and process information from travel documents, enhance the speed and efficiency of passenger clearance because they help the authorities to quickly perform tasks which, when done manually, cause passengers to stand and wait. For example, a reading machine helps the human inspector verify that a document is valid and has not been altered. Checks against "lookout" lists can be done automatically, and in advanced systems MRTD data can be compared against visa files or enrolment lists of persons pre-authorized for admission. In the near future, the machine reading of an encoded biometric will be able to help confirm that the presenter of a document is the rightful holder. Also systems can be designed to produce automatically and accurately a record of entry or departure (now done manually with an embarkation/disembarkation card) from the machine readable data on the travel document.

ENVIRONMENTAL PROTECTION

4.23 In 2001, 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

4.24 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, consistent with the agreed earliest date of 1 April 2002, the phase-out is virtually complete.

4.25 States and airports are now considering what further steps may be needed. In June the Council of ICAO adopted a new, more stringent noise standard for jet and large propeller-driven aircraft (Annex 16, Volume I, Chapter 4) for applicability on 1 January 2006. In October, the ICAO Assembly, in Resolution A33-7, endorsed the concept of a balanced approach to aircraft noise management, consisting 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. The Assembly also resolved the difficult question of operating restrictions on the noisiest Chapter 3 aircraft in that States needing to introduce such restrictions at airports with severe noise problems now have guidance on the process to be followed.

4.26 In March 2000, the United States had submitted to ICAO an Application and Memorial pursuant to Article 84 of the Convention on International Civil Aviation and the Rules for the Settlement of Differences, seeking a decision by the ICAO Council on a disagreement with 15 European States relating to Regulation (EC) No. 925/1999 ("Hushkits"). During the year, negotiations between the parties continued, with the President of the ICAO Council acting as a conciliator. In the light of these negotiations and of ICAO Assembly Resolution A33-7, the European Commission in November issued a proposal for a Directive[1] that would supersede Regulation (EC) No. 925/1999.

Aircraft engine emissions

4.27 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.

4.28 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*, 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 emphasis on developing policy options to limit or reduce greenhouse gas emissions from civil aviation. This work included monitoring advances in technology and exploring the further development of Annex 16 to specifically address emissions of global concern, and developing guidance material on operational measures to reduce emissions, as well as a methodology for assessing the environmental benefits of the implementation of CNS/ATM systems. This work also included analysing the potential role of market-based measures, such as emissions trading, emissions-related levies (charges or taxes), and voluntary agreements.

4.29 In October, the Assembly, in Resolution A33-7, requested the Council to continue studying policy options to limit or reduce the environmental impact of aircraft engine emissions, placing special emphasis on the use of technical solutions while continuing to

1. "Proposals for a Directive of the European Parliament and of the Council on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports", COM (2001) 695 dated 28 November 2001.

develop guidance for States on the application of market-based measures, and to develop concrete proposals and provide advice as soon as possible to the Conference of the Parties to the United Nations Framework Convention on Climate Change.

AVIATION MEDICINE

Smoking restrictions

4.30 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 2001, but considerable advancement towards this goal had been made, both by legislation and by airline policies, and further progress was to be expected. As a measure of success of these efforts on certain markets, the United States Department of Transportation has reported that by mid-1997 about 97 per cent of non-stop scheduled United States airline flights between that country and foreign points were smoke-free compared with around 80 per cent one year earlier. In 1998 that figure became 100 per cent. In 1997, two major European airlines, British Airways and KLM, had, respectively, 90 and 85 per cent of their international services non-smoking and went on in 1998 to prohibit smoking worldwide. By the end of 2000, all Scandinavian and the vast majority of the European airlines were smoke-free net-wide.

Substance abuse

4.31 The *Manual on Prevention of Problematic Use of Substances in the Aviation Workplace* (Doc 9654) supports Amendment 162 to Annex 1 adopted by the ICAO Council in 1998 and a similar amendment to Annex 2 (with a cross-reference in Annex 6) concerning new provisions related to the use of psychoactive substances. These new provisions contribute significantly to flight safety worldwide, primarily by promoting a higher degree of awareness and openness surrounding alcoholism, drug abuse and other forms of problematic use of psychoactive substances.

Traveller's thrombosis

4.32 Two widely reported deaths from pulmonary embolism soon after long-haul airline flights have recently provoked intense and worldwide media and community interest in the possible association between air travel and deep vein thrombosis, a severe disease that sometimes leads to pulmonary embolism which may be fatal. In 2001 the World Health Organization launched a scientific study, the WRIGHT Project, to ascertain whether such a link is real, how big the problem is and what can possibly be done about it. This research project is expected to be completed in 2005.

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PART II

WORLD OUTLOOK TO 2004

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Chapter 5
Global Trends and Forecasts

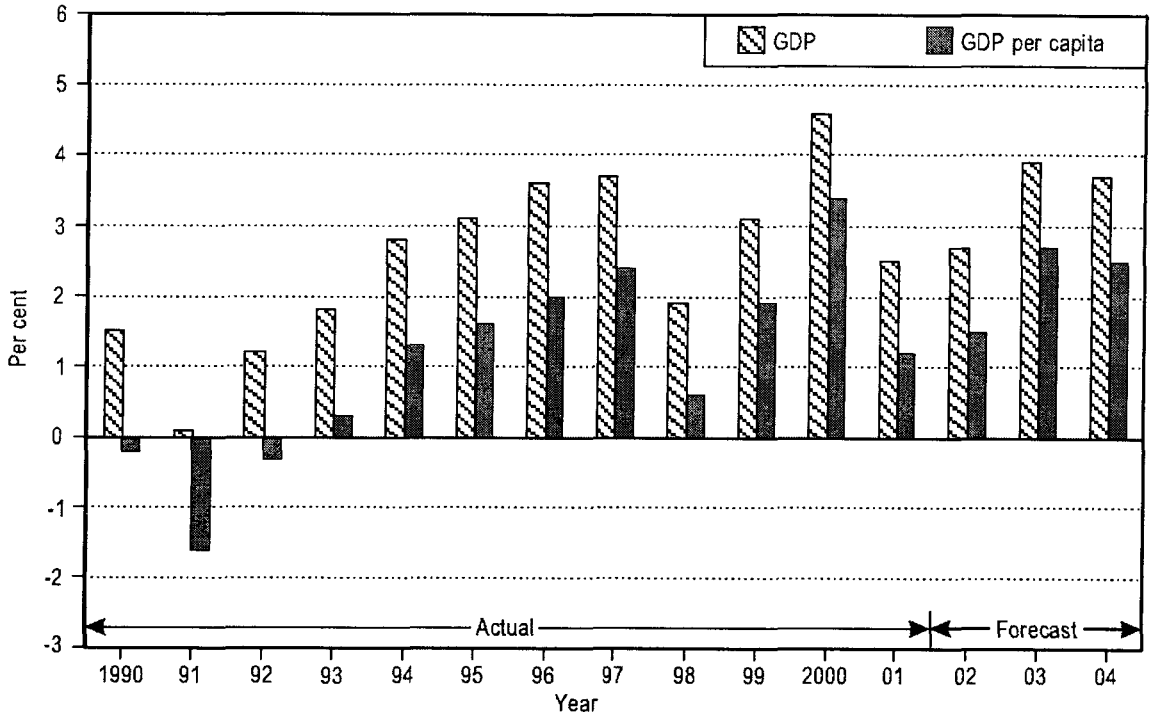
5.1 This chapter reviews historical developments in the world economy for the period 1990–2000 and anticipated developments through to 2004; examines trends in airline traffic, productivity, prices and finances; and presents airline scheduled passenger traffic forecasts and, to the extent possible, airline financial forecasts, through to 2004.

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 1990 and 2000, the aggregate world economy measured in terms of GDP grew at an average annual rate of 2.6 per cent in real terms. Growth rates varied across regions, from a high of 4.1 per cent for Asia/Pacific to a low of 0.5 for Europe including the "countries-in-transition" in Eastern Europe and the CIS (see Chapter 6 for further details). World population growth between 1990 and 2000 increased at an average annual rate of 1.4 per cent. Hence growth of the world's GDP per capita between 1990 and 2000 increased at an average annual rate of 1.2 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, the global economy grew by only 2.5 per cent in 2001.



Source: IMF, WEFA Group.

Figure 5-1. Annual change in real GDP and GDP per capita — World (1990-2004)

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 3.8 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 4.0 per cent in 2001, from 5.7 per cent in the previous year.

5.6 On several occasions in the last quarter century, sharp movements in crude oil prices have impacted powerfully on the world economy. In particular, the recessions of the mid-1970s and early 1980s were linked to the oil price increases of 1973 and 1979/1980. 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. Furthermore, world oil prices have settled into lower levels in recent years as markets have adjusted to shifts in supply and demand. In 1996, a significant and sustained increase in oil prices did occur, which resulted in increased costs to air transport, but by early 1997 oil prices had returned to pre-1996 levels, and they declined further in 1998. This two-year downward trend was reversed during 1999 when the world trade price of crude oil in U.S. dollars more than doubled from about $10 per barrel at the beginning of the year to almost $25 per barrel towards the end, reaching a nine-year high. The crude oil prices continued to pick up in 2000, especially in the third and fourth quarters. For the whole year the crude oil price is estimated to have averaged at about $28 per 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 per barrel. The price averaged out for the year at $25 per barrel. The downward trend seems to have reversed itself in 2002 based on data for the first five months of the year.

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. During 2001, inflation in most industrial countries stabilized at an aggregate rate of 2.2 per cent. Inflation rates in developing countries as a group continued to follow a similar overall declining trend; in 2001, a new low average rate of 5.7 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 a growth of 4.7 per cent. However, the latter part of 2000 and the year 2001 witnessed a marked slowdown in all major regions. The latest trends indicate that the economic slowdown has bottomed out mainly in the United States and to a lesser extent in Europe and some countries in Asia. Economic growth is therefore expected to start regaining momentum. The projections for global and regional economic growth that have been used as a basis for air traffic forecasts over the period to 2004 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 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 in the United States will rebound in 2002 driven initially by the completion of the inventory cycle, and a moderate pickup in final domestic demand, underpinned by the substantial macroeconomic stimulus in the pipeline as well as the effect of the previous fall in oil prices. It is projected that the United States' economy will expand further in 2003 and 2004. The rebound in the European economy is not expected before 2003 mainly due to the weakness in external demand.

5.10 After a weak performance in 2001, the economy of the Asia/Pacific region is expected to rebound in 2002 and build momentum in 2003 in spite of Japan's weak economic performance. Having experienced strong growth in 2000, the Middle Eastern economy grew at a lower rate in 2001 and is expected to slow down further in 2002 before improving

Table 5-1. Economic growth — World and regions (2000–2004)
(real average annual GDP growth rates, per cent)

Region	Actual 2000	Estimated 2001	Forecast 2002	2003	2004
Africa	3.1	3.7	3.2	4.0	4.2
Asia/Pacific	5.7	3.6	4.0	4.9	4.0
Europe	3.8	1.9	1.8	3.1	3.0
Middle East	5.4	4.5	2.8	4.2	4.6
North America	4.1	1.2	2.3	3.4	3.4
Latin America and Caribbean	4.4	0.7	0.9	3.3	4.5
World	4.6	2.5	2.7	3.9	3.7

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

gradually through to the end of the forecast period. The African economy is also projected to grow at a lower rate in 2002 before improving in 2003 and 2004. After a rebound in 2000, the economy of the Latin America and Caribbean region grew at a significantly lower rate in 2001 and is expected to stabilize in 2002 before recovering its strength through 2003 and 2004. Chapter 6 provides further details on regional economic developments.

AIRLINE TRAFFIC TRENDS

5.11 Total scheduled airline traffic, measured in terms of total tonne-kilometres performed, grew at an average annual rate of 4.6 per cent between 1990 and 2001. Passenger-kilometres grew at an average rate of 4.0 per cent per annum and freight tonne-kilometres at 5.9 per cent per annum. Global traffic data for each year of the period 1990–2001 are given in Tables 5-2 (total traffic) and 5-3 (international traffic).

5.12 In broad terms, the pattern of traffic growth over the 1990–2001 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 during most of the

Table 5-2. Total international and domestic revenue traffic — World (1990–2001) (scheduled services of airlines of ICAO Contracting States)

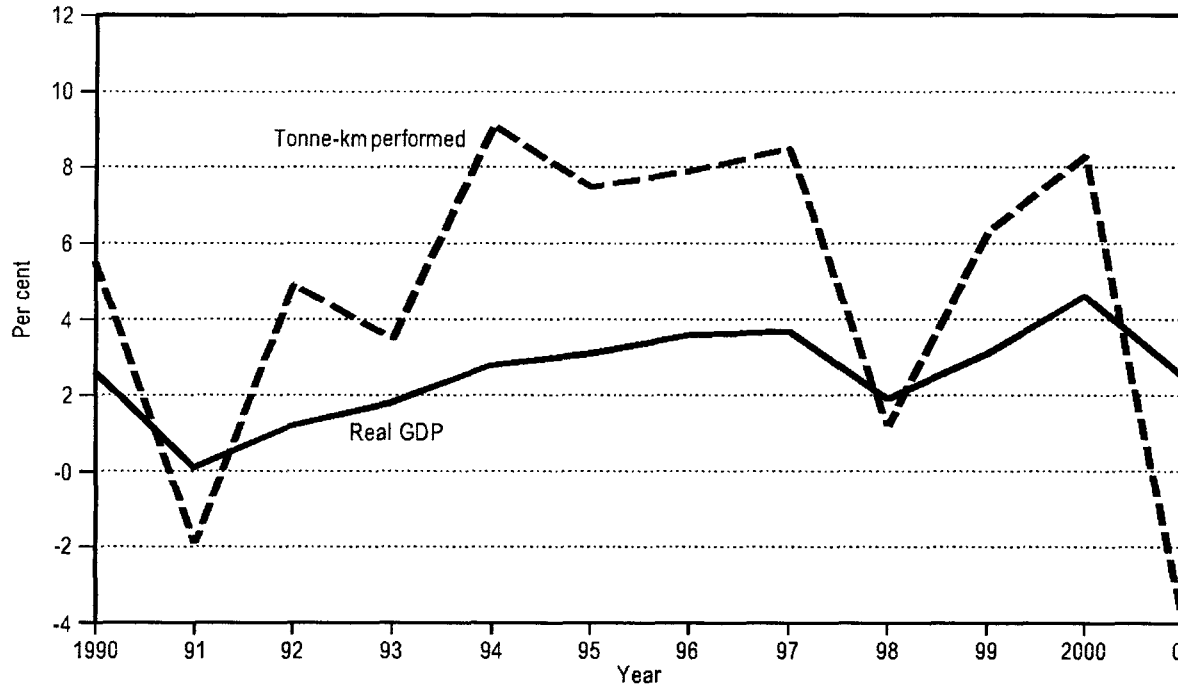
Year	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1990	1 165	5.0	1 894 250	6.5	18.4	1.7	58 800	2.9	5 330	5.3	235 220	5.5
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	1 621	-2.1	2 930 370	-2.9	28.7	-5.0	110 680	-6.2	5 280	-12.7	385 370	-3.9

Source: ICAO Air Transport Reporting Form A.

Table 5-3. International revenue traffic — World (1990–2001) (scheduled services of airlines of ICAO Contracting States)

Year	Passengers carried		Passenger-km		Freight tonnes carried		Freight tonne-km performed		Mail tonne-km performed		Total tonne-km performed	
	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)	Millions	Annual increase (%)
1990	280	6.9	893 500	8.5	8.6	0.0	46 320	3.1	2 190	5.3	130 730	6.3
1991	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	1 716 560	-3.5	17.6	-6.4	94 870	-6.6	2 620	-1.9	258 550	-4.7

Source: ICAO Air Transport Reporting Form A.

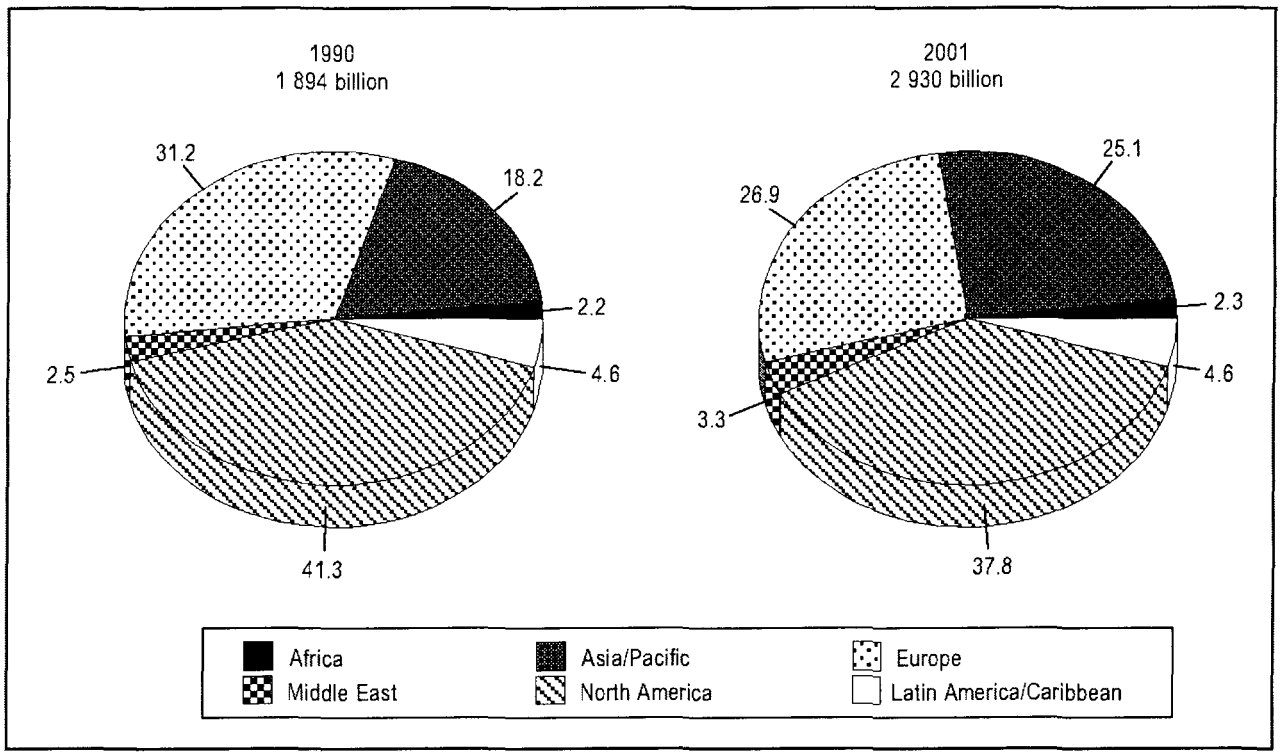


Source: IMF, ICAO Air Transport Reporting Form A.

Figure 5-2. GDP and scheduled traffic growth — World (1990-2001)

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 have had a negative impact on traffic in late 2000 and during the first eight months of 2001. The events of 11 September 2001 exacerbated the already difficult situation. While GDP grew moderately at a rate of 2.5 per cent in 2001, traffic declined by an estimated 2.9 per cent, the first decline since 1991 and the second since the Second World War.

5.13 The regional distribution of scheduled passenger traffic for the years 1990 and 2001 is illustrated in Figure 5-3. The airlines of the North American and European regions dominate, contributing 72.5 per cent to the total traffic in 1990, although the share had declined to 64.7 per cent by 2001. Passenger traffic performed by airlines registered in the Asia/Pacific region increased from 18.2 per cent of the total world traffic in 1990 to about 25.1 per cent in 2001. The remaining regions contributed 9.3 per cent of the traffic in 1990 and 10.2 per cent in 2001.



Source: ICAO Air Transport Reporting Form A.

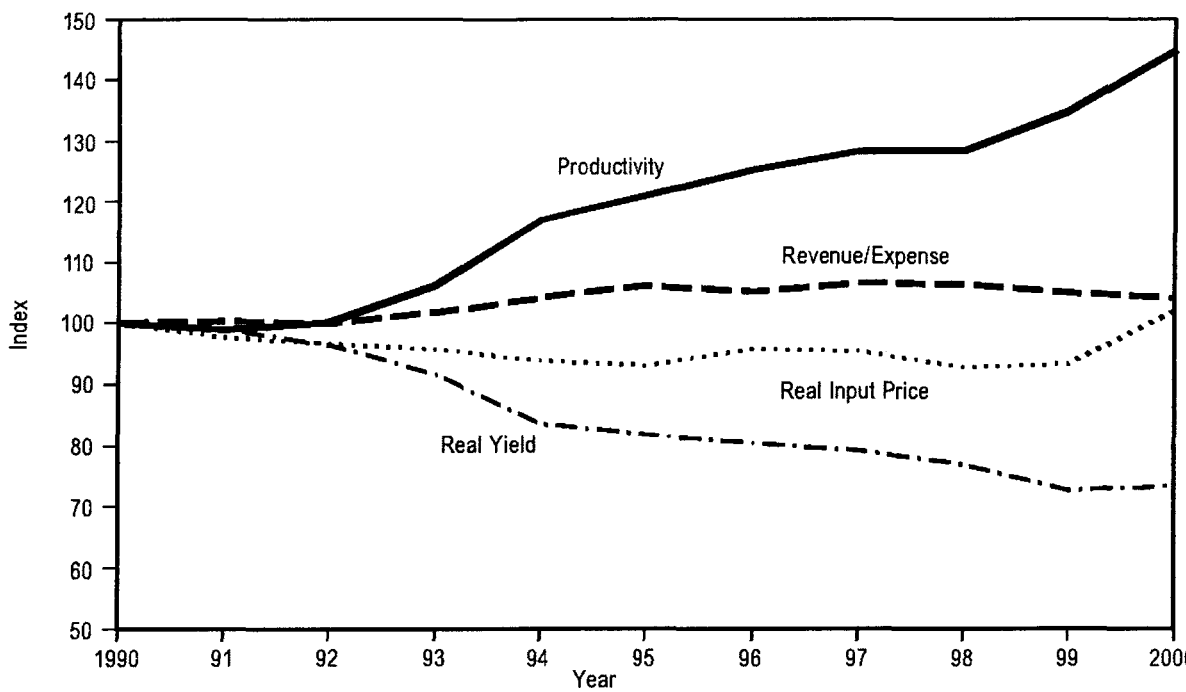
Figure 5-3. Regional distribution of scheduled passenger traffic — World (1990 and 2001) (percentage of passenger-kilometres performed)

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 1990 has been about 3.8 per cent. The progressive absorption of new technology aircraft into airline fleets has been a major reason for the improvement in productivity. In particular, the new aircraft are more fuel- and labour-efficient. Improved aircraft utilization and load factors have also made important contributions.

5.15 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 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.

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 1990 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



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

Figure 5-4 Trends in performance of scheduled airline industry — World (1990-2000)

considerably over the business cycle. During the buoyant years of the 1980s, rapid growth in demand resulted in a more intensive use of airline resources and strong productivity growth. Airlines were able to improve their operating results and also offer relatively low fares and rates to their customers. In the early 1990s, market conditions changed as demand weakened and the utilization of airline resources tended to decline. The emergence of excess capacity and consequent competitive pressures 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. A much better operating result was obtained in 1994, and by 1995 the industry delivered an operating surplus of $13.5 billion and obtained a positive net result of about $4.5 billion. In 1996, a reduced operating surplus of about $12.3 billion was achieved, with a net result of $5.3 billion, while in 1997, there was an operating surplus of $16.3 billion and a net result of almost $8.6 billion. In 1998, the operating surplus reached $15.9 billion with a net result of $8.2 billion, while in 1999 the industry generated an operating surplus of $12.3 billion and a net profit of $8.5 billion. In 2000, the operating surplus decreased to about $10.7 billion whereas the net profit declined significantly to $3.7 billion. According to preliminary estimates for 2001, an operating loss of about $11.0 billion is estimated.

Table 5-4. Operating and net results[1] — World (1992-2001[2]) (scheduled airlines of ICAO Contracting States)

Year	Operating revenues U.S.$ (millions)	Operating expenses U.S.$ (millions)	Operating result Amount U.S.$ (millions)	Operating result Percentage of operating revenues	Net result[3] Amount U.S.$ (millions)	Net result[3] Percentage of operating revenues	Direct subsidies U.S.$ (millions)	Income taxes U.S.$ (millions)
1992	217 800	219 600	-1 800	-0.8	-7 900	-3.6	140	1 040
1993	226 000	223 700	2 300	1.0	-4 400	-1.9	150	-270
1994	244 700	237 000	7 700	3.1	-200	-0.1	70	-1 300
1995	267 000	253 500	13 500	5.1	4 500	1.7	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[4]	305 300	316 200	-10 900	-3.6	-12 000	-3.9		

1. *Revenues and expenses are estimated for non-reporting airlines.*
2. Up to and including 1997, operations within the CIS 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.*

Source: ICAO Air Transport Reporting Form EF-1.

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 shares of "Flight crew" and "Flight operations — Other", which includes rental of aircraft from other companies. This suggests an increase in labour costs and some restructuring within the airline industry. The share of indirect expenses and especially ticketing, sales and promotion expenses has decreased slightly, with a corresponding increase in the share of direct aircraft expenses which resulted from the increases in flight operations expenses.

5.18 The variations in the annual operating result, measured as a percentage of airline revenue, are illustrated graphically for the period 1990–2001 in Figure 5-5, which also shows the fluctuations in traffic growth over the same period. There is a positive correlation between this measure of financial return and the growth in traffic. However, close examination of annual changes reveals that the recession in financial results began in 1990 when traffic growth was 5 per cent. Furthermore, traffic rebounded in 1992 after a decline in 1991, while the operating result remained in deficit. Part of the explanation of the financial outcome in 1990 lies in a substantial increase in fuel prices (and hence operating expenses), without compensating increases in yields. In 1992, yields declined significantly in nominal terms, helping to boost traffic but having a depressing effect on financial return. In 1993 and 1994, yields became somewhat more stable and cost efficiency increased progressively, resulting in successive improvements in financial performance. Financial performance continued to improve in 1995 but was hampered slightly in 1996 by the increase in fuel prices. Financial performance improved further in 1997 and 1998 due to increases in average passenger load factors in 1997 and declines in fuel prices both in 1997 and 1998. In 1999 the financial performance was less buoyant than in preceding years. 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, have led to a significant deterioration in airline financial performance.

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 that 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

Table 5-5. Distribution of operating revenues and expenses — World (1990 and 2000) (scheduled airlines of ICAO Contracting States[1])

Description	Distribution by item (per cent) 1990	2000	Change in per cent share of item 1990 to 2000
OPERATING REVENUES			
Scheduled services (total)	87.2	86.7	-0.5
Passenger	76.9	75.7	-1.2
Freight	9.2	10.3	1.1
Mail	1.1	0.7	-0.4
Non-scheduled operations	3.6	3.6	0
Incidental	9.2	9.7	0.5
TOTAL	100.0	100.0	—
OPERATING EXPENSES			
Direct aircraft			
Flight operations (total)	28.0	31.1	3.1
Flight crew	6.9	8.3	1.4
Fuel and oil	15.1	14.4	-0.7
Other	6.0	8.4	2.4
Maintenance	11.4	10.6	-0.8
Depreciation and amortization	6.9	6.5	-0.4
Subtotal	46.3	48.2	1.9
Indirect			
User charges and station expenses (total)	16.1	17.2	1.1
Landing and associated airport charges	3.8	4.2	0.4
En-route facility charges	1.6	2.8	1.2
Station expenses	10.7	10.2	-0.5
Passenger services	10.4	10.1	-0.3
Ticketing, sales, promotion	16.3	12.7	-3.6
General, administrative and other operating expenses	10.9	11.8	0.9
Subtotal	53.7	51.8	-1.9
TOTAL	100.0	100.0	—

1. Excludes operations within the CIS.

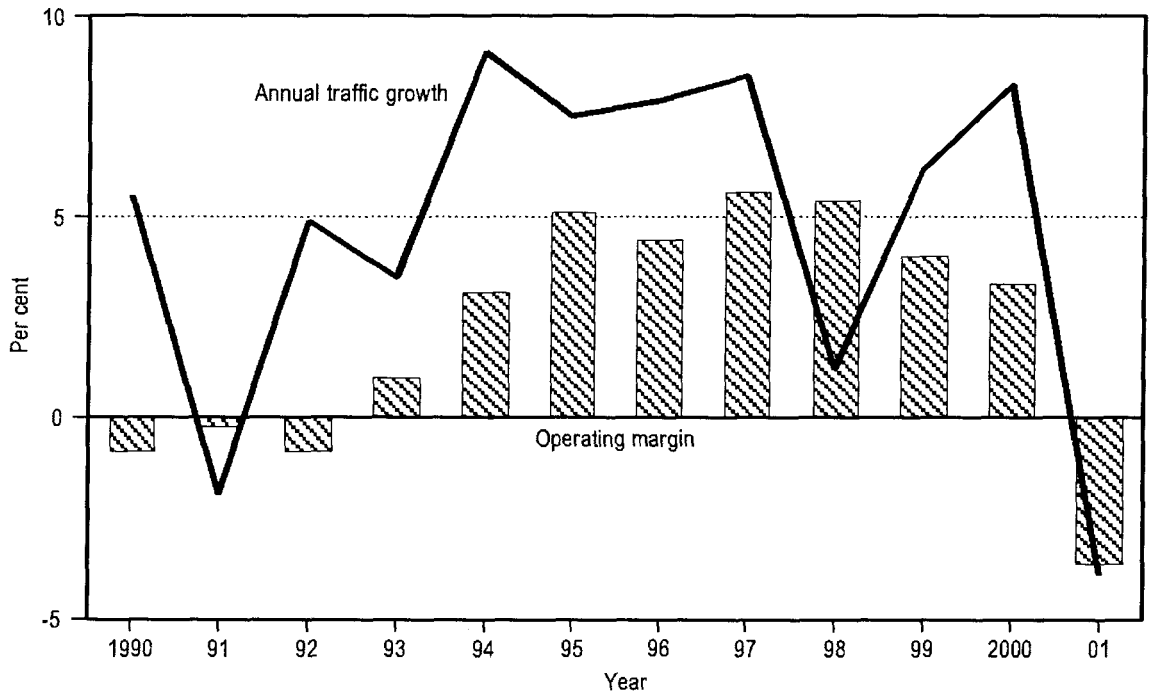
Source: ICAO Air Transport Reporting Form EF-1.

the level of deliveries to rebound significantly in 2000 and drop again in 2001 below the level of deliveries, 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 study, econometric analyses were carried out to determine the historical relationship between airline passenger traffic, economic cycles and airline yield levels. These analyses were used to translate the expectations of future global economic development and yield levels into annual projections of traffic demand for the years 2002, 2003 and 2004 according to the methodology described in Appendix 2. These forecasts were then reviewed in the light of the recorded activity in the first months of 2002 and the prospective changes in other relevant factors which could not be incorporated into the econometric models.

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

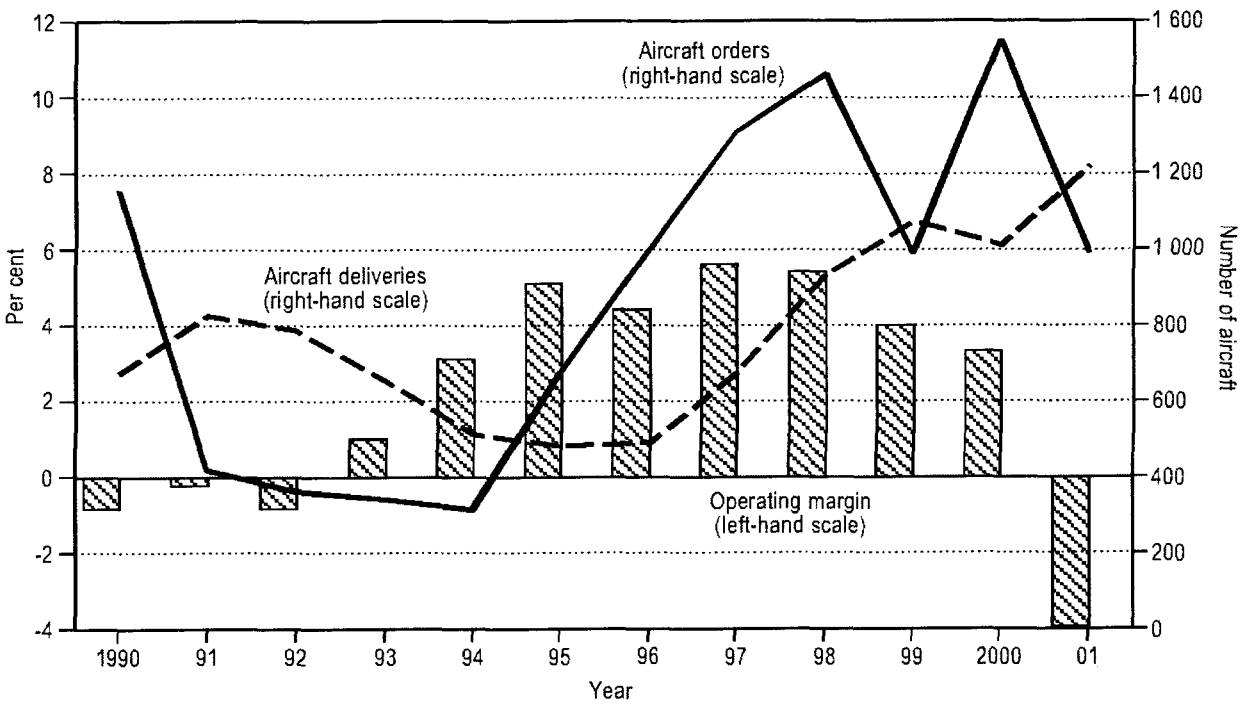


Source: ICAO Air Transport Reporting Forms A and EF-1.

Figure 5-5. Financial return and traffic growth of scheduled airline industry — World (1990-2001)

5.23 The economic forecasts, which were introduced at the beginning of this chapter, are based on assumptions about broad business cycle conditions and developments, fiscal and monetary policy settings and the international trade and financial environment. Assumptions related to population growth and productivity improvement that affect aggregate economic output over the longer term are also taken into consideration. These factors are largely external to the aviation sector. The reasonably positive economic outlook presented in Figure 5-1 and Table 5-1 augurs well for global traffic demand over the forecast period.

5.24 The prospects for airline yields are closely related to cost developments and market conditions in the airline industry. Productivity improvement in the airline industry should continue to produce cost savings, thereby providing some potential for real reductions in air fares. Changes in fuel prices have had important effects on costs, and hence on both financial returns and airline yields, at certain times in the past. In recent years, with the exception of 1996, fuel price volatility has been short term, with limited impact on year-average price levels and airline yields. However, after soaring in 1999 and 2000, fuel prices declined in 2001 but started to increase again in 2002. Airline fuel expenses are expected to stay volatile during the forecast period. Salaries and wages represent the largest airline expense item. Labour-cost pressures could build up gradually over the next few years with consequences for airline yields. These various cost pressures will provide a benchmark for airline yields, with revenues needing to be sufficient to cover costs over the long term. However, in the short term, movements in yields will be influenced by competitive conditions in airline markets.



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

Figure 5-6. Financial return and aircraft supply — World (1990-2001)

5.25 The global and regional scheduled passenger traffic forecasts for 2002, 2003 and 2004, developed from economic and yield assumptions and other considerations, are presented in Table 5-6. General economic performance is expected to provide the main support for traffic demand. Global passenger traffic is expected to stabilize in 2002 and to rebound in 2003 at 7.1 per cent with a further growth of 5.6 per cent in 2004. These forecasts are illustrated in Figure 5-7, together with the annual growth pattern over the past 10 years.

5.26 Traffic growth will vary by geographic region because of the impact of specific local or regional factors. It is anticipated that the traffic of the airlines of the Asia/Pacific region will grow at the highest rate among ICAO regions with the exception of the year 2002. Markets for European airlines are forecast to be reasonably buoyant after 2002 benefiting from the economic recovery. The airlines of the Middle East are also expected to experience relatively strong rates of traffic growth for the years 2003 and 2004. The traffic of the airlines of Africa and Latin America/Caribbean is expected to grow moderately in 2002, but projected to reach higher growth rates in 2003 and 2004. Following a negative growth in 2002, a rebound is expected in the North American markets with growth rates slightly below the world average. Further details of the trends and forecasts on a region-by-region basis may be found in Chapter 6.

Table 5-6. ICAO scheduled passenger traffic forecasts — World and regions (2002-2004) (passenger-kilometres performed)

	ACTUAL			ESTIMATED		FORECAST					
Region of airline registration	1990 (billions)	2000 (billions)	Average annual growth (%)	2001 (billions)	Growth (%)	2002 (billions)	Growth (%)	2003 (billions)	Growth (%)	2004 (billions)	Growth (%)
Africa	42.2	66.4	4.6	67.3	1.4	69.3	3.0	73.8	6.5	77.4	4.8
Asia/Pacific	344.1	735.5	7.9	736.0	0.1	761.8	3.5	821.9	7.9	879.5	7.0
Europe	590.6	804.1	3.1	787.4	-2.1	778.0	-1.2	838.6	7.8	888.1	5.9
Middle East	46.9	93.8	7.2	96.8	3.2	100.5	3.8	108.0	7.5	114.2	5.7
North America	783.2	1 175.7	4.1	1 108.8	-5.7	1 083.3	-2.3	1 148.3	6.0	1 200.0	4.5
Latin America/ Caribbean	87.2	141.8	5.0	134.0	-5.5	136.7	2.0	1 46.9	7.5	154.1	4.9
World	1 894.2	3 017.3	4.8	2 930.3	-2.9	2 929.5	0	3 137.6	7.1	3 313.2	5.6

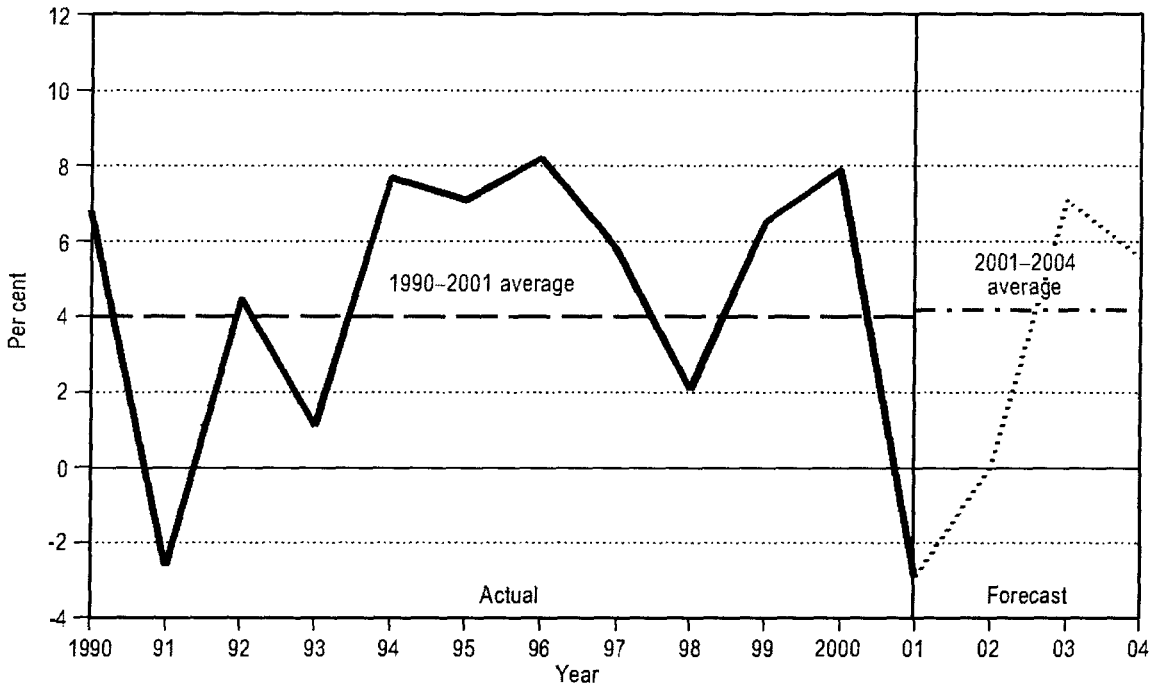


Figure 5-7 Scheduled passenger traffic growth — World (1990-2004) (passenger-kilometres performed)

AIRLINE FINANCIAL FORECAST

5.27 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, because 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.

5.28 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 decline by about 0.4 per cent in 2002, rebound by 7.3 per cent in 2003 to reach the level attained in 2000. The total revenue is projected to grow by 5.8 per cent in 2004. These compare with an average rate of 4.0 per cent per annum experienced over the past ten years.

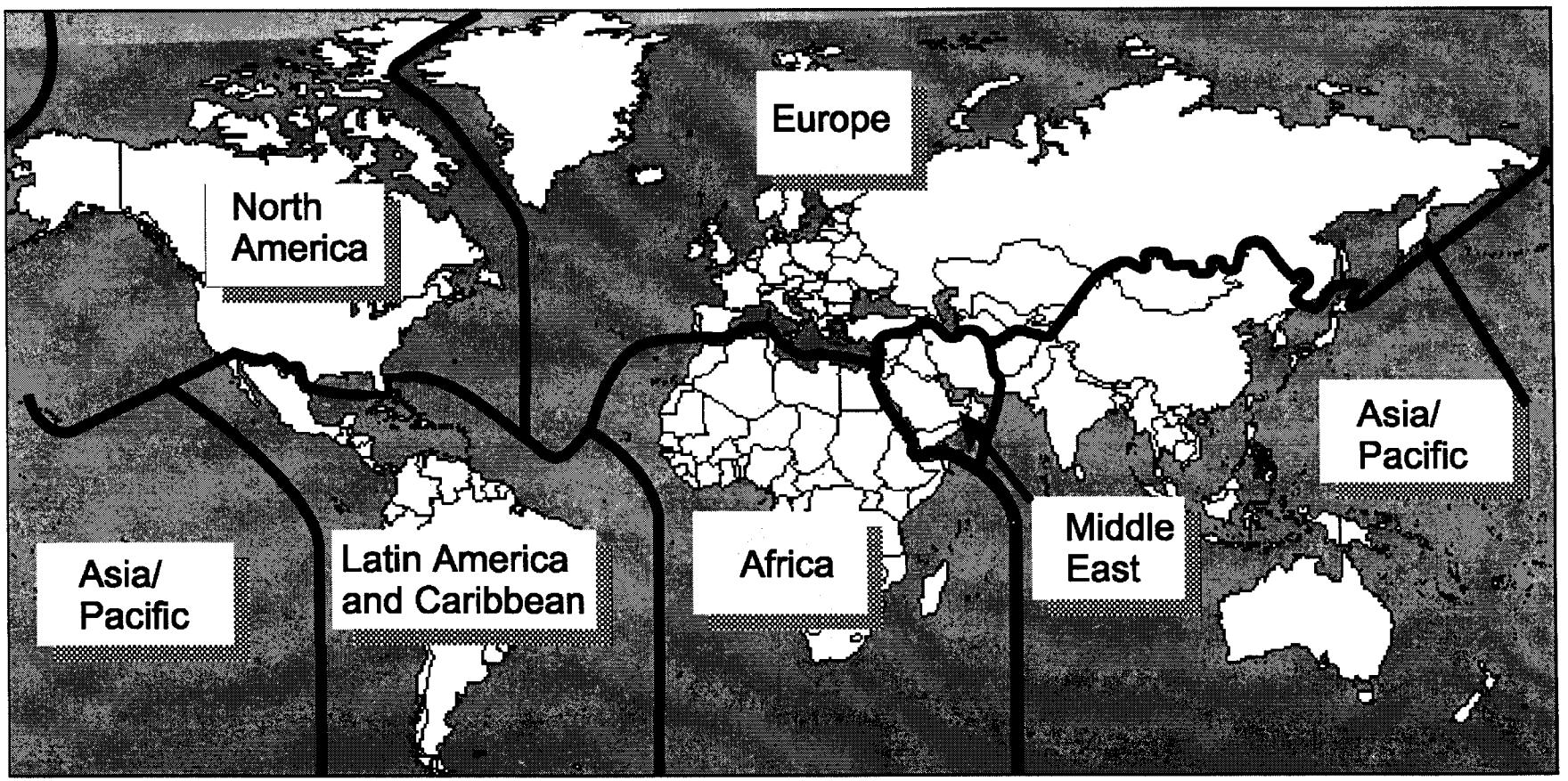
5.29 The forecast for airline expenses is based on assumptions for the expected trends in quantity of inputs (labour, fuel and aircraft capacity) and the prices of those inputs, the latter being primarily determined by the outlook for general inflation. Airlines are taking steps to trim employment levels 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 decline at the rate of about 0.8 per cent in 2002 and increase by 4.7 and 5.2 per cent in the years 2003 and 2004 respectively (compared to an average rate of 4.4 per cent per annum experienced over the past ten years).

5.30 The operating result for the world's scheduled airlines is the difference between operating revenues and expenses, the forecasts of which have 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 2002 at –3.2 per cent (compared to an estimated –3.6 per cent in 2001). This result improves progressively and reaches an almost positive level by 2004. 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 unforeseen events of significance.

PART III

REGIONAL PERSPECTIVES
(2001 to 2004)

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 2001, followed by historic and forecast economic trends, which are presented as a background to airline finances and scheduled passenger traffic trends for each region since 1990, as well as forecast medium-term trends until 2004. 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

The region in 2001

Table 6-1. Scheduled traffic — Airlines of Africa (2001/2000)

	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	18 240	-0.6	3.4	31 280	-2.2	1.9
Passenger-kilometres performed (millions)	58 300	2.3	3.4	67 260	1.3	2.3
Freight and mail tonne-km performed (millions)	2 000	-2.7	2.1	2 100	-2.8	1.8

Source: ICAO Air Transport Reporting Form A.

6.2 The Economic and Monetary Community of Central Africa and the Economic Community of West African States agreed to move forward with the liberalization of air transport in the two regions, with the aim of achieving full implementation by June 2004. The African Civil Aviation Commission (AFCAC), as the specialized agency of the Organization for African Unity (OAU) responsible for regional civil aviation development, during its 16th

Plenary Session, *inter alia*, adopted Resolution S16-2 addressing appropriate follow-up action, including subregional coordination, for the implementation of the Yamoussoukro Declaration on the liberalization of access to the African air transport market, adopted in 1999. According to Resolution S16-9, it also pledged to strengthen cooperation not only with other subregional or regional Commissions, i.e. ACAC, ECAC, and Latin American Civil Aviation Commission (LACAC), but also other bodies dealing with civil aviation, i.e. Agency for Air Navigation Safety in Africa and Madagascar (ASECNA), ACI, ICAO and WTO-OMT. With the objective of promoting and developing the link between international tourism and air transport services, the AFCAC/WTO-OMT International Conference on Tourism in Africa, held in Windhoek, Namibia, brought together Ministers charged with civil aviation and tourism. Also in the spirit of seeking international support, an MoU was signed between AFCAC and ACI to foster cooperation, especially in the fields of environmental protection, aviation security and training. Fellowships for training African nationals in civil aviation disciplines were extended for another year by the Civil Aviation Authority of Singapore and newly offered by the Civil Aviation Authority of Egypt.

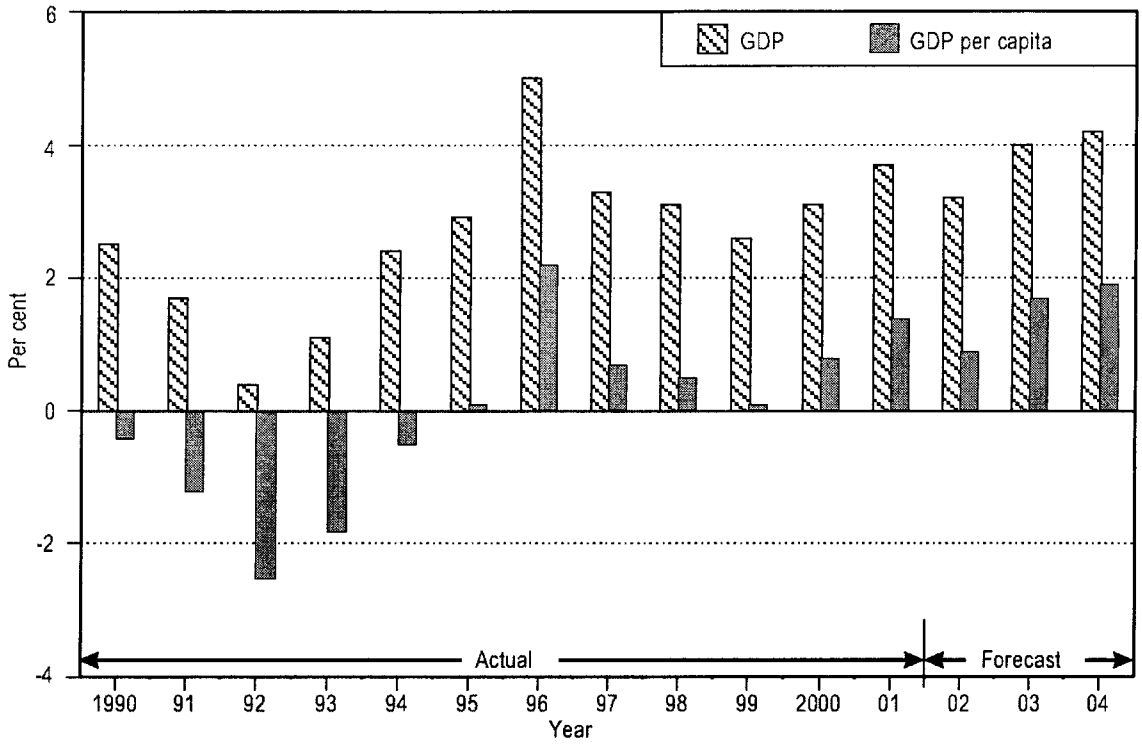
Economic trends

6.3 Over the 1990–2000 period, the aggregate African economy grew at an average annual rate of 2.6 per cent (GDP in real terms), although GDP per capita declined at a rate of –0.1 per cent 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 the decade, particularly in sub-Saharan Africa. This can be attributed to the rising incidence of civil conflict and, to a lesser extent, to the losses from terms of trade resulting from weak commodity prices and most recently from high oil prices. The aggregate African economy is estimated to have grown at 3.7 per cent in 2001.

6.4 Economic growth in Africa is projected to rise to 3.2 per cent in 2002, 4.0 and 4.2 per cent in 2003 and 2004, respectively, with activity improving fastest in those countries that suffered most from domestic or external conflict. This trend will, however, depend on the implementation of sound macroeconomic and structural policies as well as significant improvement in the security situation in many countries. This outlook may also be affected by the strength of the economic recovery in other regions.

Airline financial trends

6.5 Over the 1990–2000 period, operating revenues (in dollars) of the scheduled airlines of the African region increased at an average annual rate of 0.1 per cent (compared to the

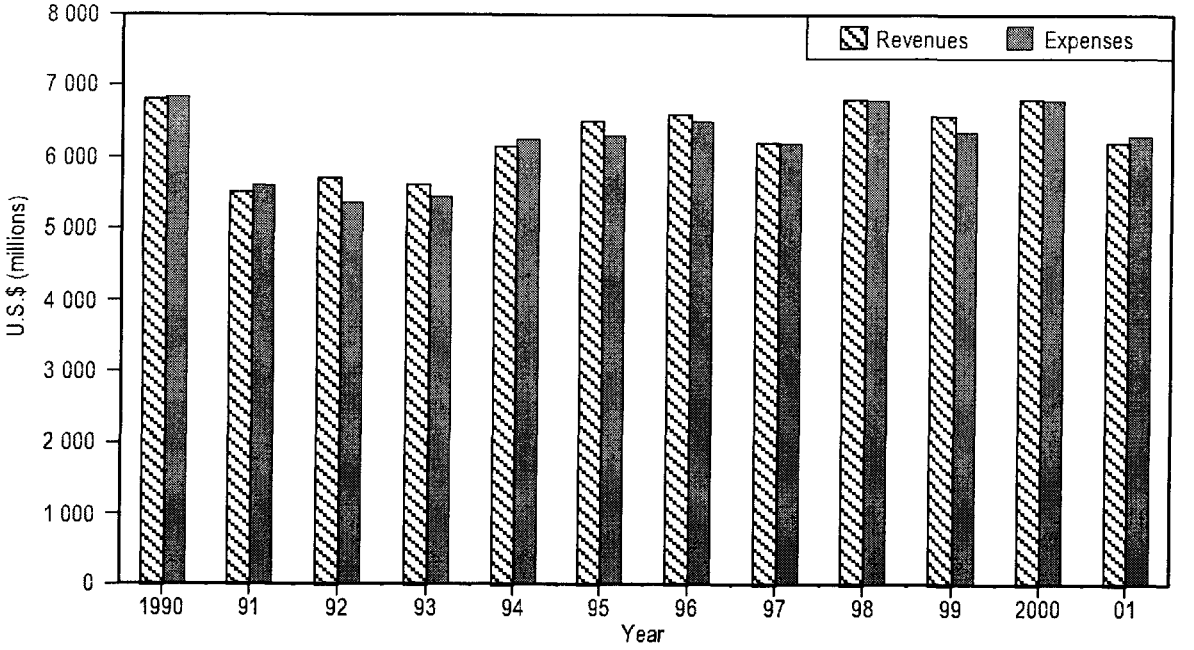


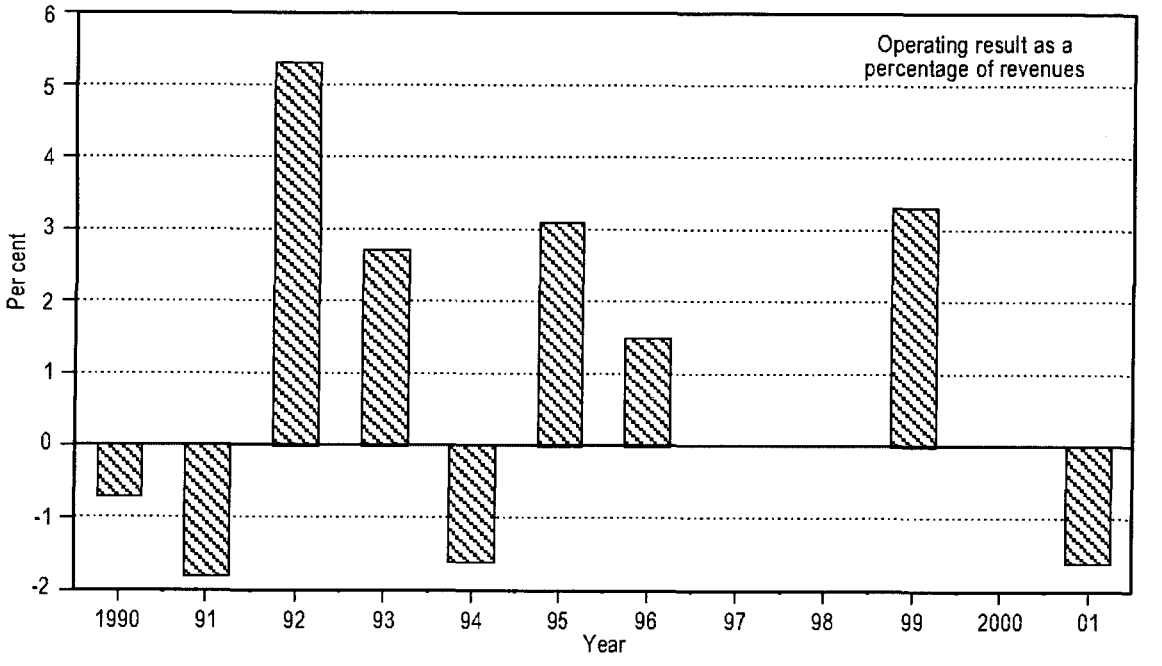
Source: IMF, WEFA Group.

Figure 6-1. Annual change in real GDP and GDP per capita — Africa (1990–2004)

world annual average increase of 5.1 per cent). Operating expenses for the same period also increased by 0.1 per cent per annum. These rates reflect the relatively low traffic growth experienced over most of the period, the steady decline in average yields and the efforts by African airlines to improve efficiency and financial performance. Since 1989, negative operating results have been experienced for 1990, 1991, 1994 and 2001 as illustrated in Figure 6-2.

6.6 For the 1990–2000 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 6.6 per cent in real terms (compared to a 3.7 per cent decline for the world). The year-to-year comparisons of the changes in real passenger yield of African and world airlines are illustrated in Figure 6-3. Since 1990, average yields of the region's airlines have decreased more than the world average yields each year, except 1998.

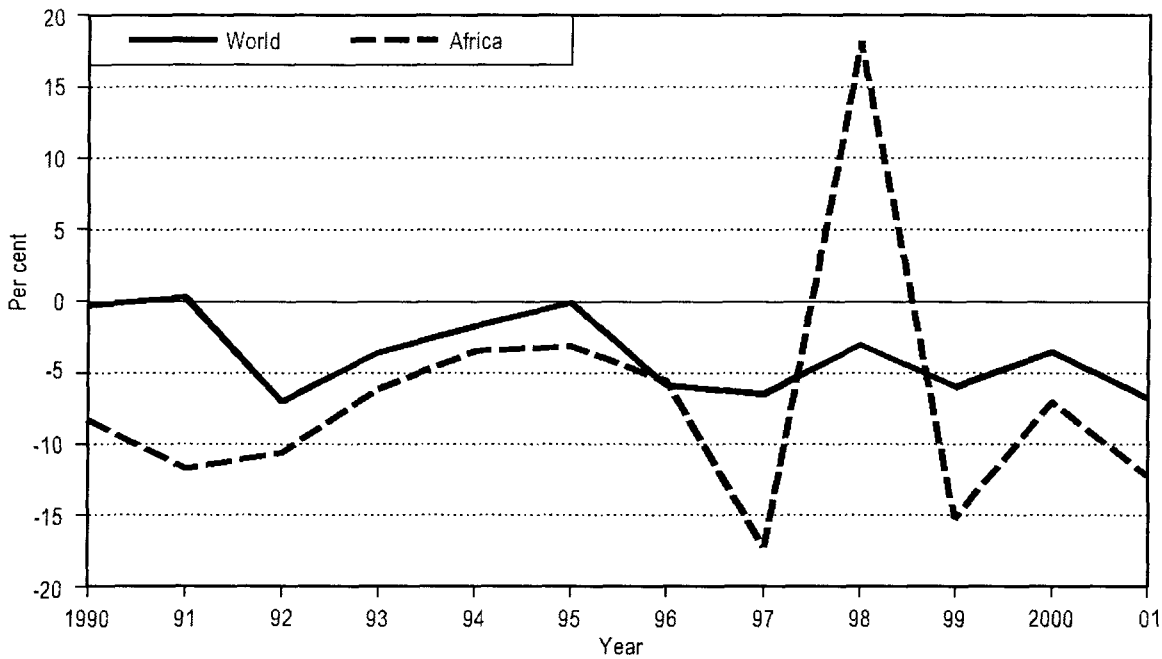




Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-2. Scheduled airline operating revenues and expenses — Africa (1990-2001)



Notes.— 2001 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

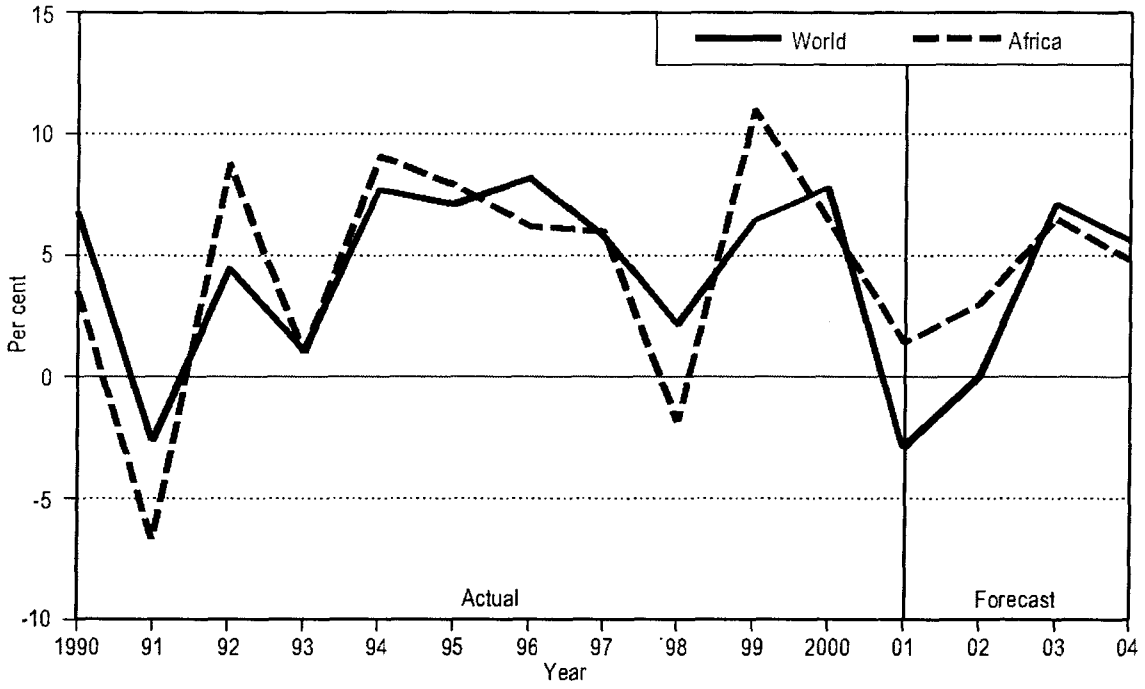
Source: ICAO Air Transport Reporting Forms A and EF-1.

Figure 6-3. Annual change in real scheduled passenger yield — Africa and World (1990–2001)

Airline passenger traffic trends and forecast

6.7 Over the 1990–2000 period, scheduled passenger traffic (in PKPs) of the airlines of the African region increased at an average annual rate of 4.6 per cent (compared to the world annual average of 4.8 per cent). Traffic growth in recent years, except for 2001, markedly exceeded this decade's average; 6.2 per cent growth was recorded in 1996 followed by a 6.1 per cent growth in 1997. While there was a reversal in 1998 with traffic declining by 1 per cent (compared to world average growth of 2.1 per cent), traffic rebounded in 1999, growing by 11.0 per cent and continuing in 2000 at a 6.5 per cent rate. In 2001, total passenger traffic is estimated to have increased by 1.3 per cent only. 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.

6.8 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 3.0, 6.5 and 4.8 per cent for the years 2002, 2003 and 2004, respectively.



Source: ICAO.

Figure 6-4. Scheduled passenger traffic growth (PKPs) — Africa and World (1990–2004)

ASIA/PACIFIC

The region in 2001

Table 6-2. Scheduled traffic — Airlines of Asia/Pacific (2001/2000)

	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	120 370	-0.4	22.6	376 360	2.4	23.2
Passenger-kilometres performed (millions)	505 280	-3.0	29.4	736 040	0.1	25.1
Freight and mail tonne-km performed (millions)	35 070	-6.7	36.0	38 890	-5.5	33.5

Source: ICAO Air Transport Reporting Form A.

6.9 During 2001, activities to foster liberalization of air transport services continued albeit at a slower pace. Five like-minded members of APEC (Brunei, Chile, New Zealand, Singapore and the United States) entered a multilateral "open skies" agreement, which started bilaterally with the Kona agreement between the United States and Brunei in 1997. Bilateral agreements involving Pacific Island States were concluded or ratified (for details see Table A1-1). The Pacific Forum conferred in September on Samoa to tackle the proposed Pacific Island Air Service Agreement and other aviation policy matters.

6.10 Political instabilities affected civil aviation operations when the Sri Lankan Airlines fleet suffered a terrorist attack at Bandaranaike International Airport on 24 July which caused heavy losses in fleet assets but did not claim human lives.

6.11 Under the Singapore Cooperation Programme, sponsored by the Ministry of Foreign Affairs, Singapore, 100 training fellowships are offered at the Singapore Aviation Academy, administered through ICAO's Technical Co-operation Bureau, 13 of which were awarded in 2001 with the balance targeted for implementation in 2002 and 2003. The fellowships, which are open to all developing Contracting States of ICAO, emphasize training in the fields of flight safety and air traffic as well as civil aviation management.

Economic trends

6.12 Over the 1990–2000 period, the Asia/Pacific economy (GDP) grew at an average annual rate of 4.1 per cent in real terms, and GDP per capita increased at 2.6 per cent, the highest growth rates of all ICAO regions. Asia/Pacific, having gained not only the largest

share in the world economy, 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 and continued to expand at a 5.7 per cent rate in 2000.

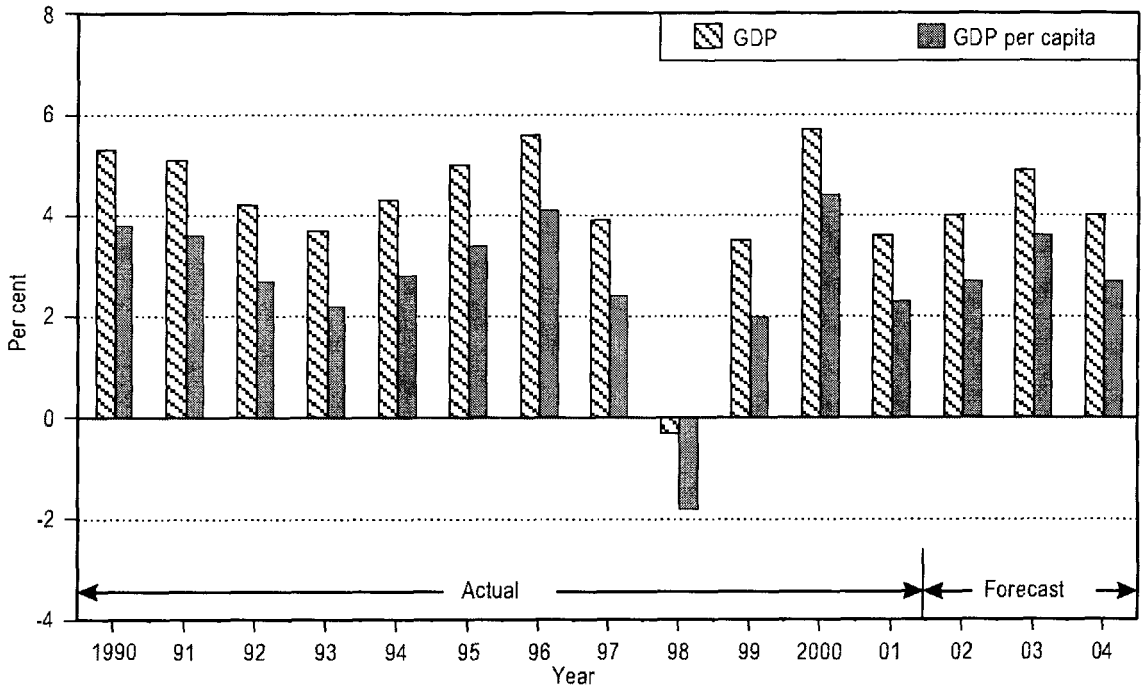
6.13 Although weakening demand from some major trading partners contributed to slow down economic growth in Asia and the Pacific, its GDP still grew at 3.6 per cent in 2001, above the world average. GDP growth in the majority of developing countries of Asia weakened in an economic climate marked by reduced international trade volumes, which strongly affected export-oriented economies. It worsened towards the end of the year in the aftermath of the events of 11 September. Most severely affected were highly export-driven Southeast Asian economies in part due to their related exposure to contract manufacturing. The downturn in electronic industries was particularly strong in information and communication technologies, for instance in Singapore where the GDP even fell in 2001. China managed a GDP growth of 7.3 per cent in spite of reduced export growth because it could to some extent compensate with a strong domestic demand; expectations of China's entry into the WTO stimulated direct foreign investment. India's economy surpassed its previous annual performance and grew by 5.4 per cent, benefiting from strong demand for agricultural produce.

6.14 Japan's GDP contracted by almost 0.4 per cent during 2001, which reflects the slowdown in other parts of the world, persisting weak consumer confidence and underlying structural weaknesses, especially in the corporate and financial sectors. Among other governments in the region, the Japanese Government reacted to the sudden and severe downturn with growth-stimulating domestic policies, using fiscal measures to stimulate their domestic economies. Monetary authorities reduced interest rates as the recessionary pressure became more severe. The Australian and New Zealand economies remained somewhat insulated from these trends and grew at around 2.4 per cent, similar to the world average. Pacific Island economies suffered lower foreign exchange earnings due to lower prices for their export commodity.

6.15 In view of these developments, the aggregate Asia/Pacific GDP is projected to grow in real terms at 3.6 per cent in 2001 and to improve in 2002 and 2003, with expected growth rates of 4.0 and 4.3 per cent, respectively. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-5.

Airline financial trends

6.16 Over the 1990–2000 period, operating revenues of the scheduled airlines of the Asia/Pacific region increased at an average annual rate of 6.0 per cent (compared to the world average annual growth rate of 5.1 per cent). Operating expenses for the same period increased by 6.0 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 estimated at around $0.7 billion, about $2.4 billion lower than that of 2000.



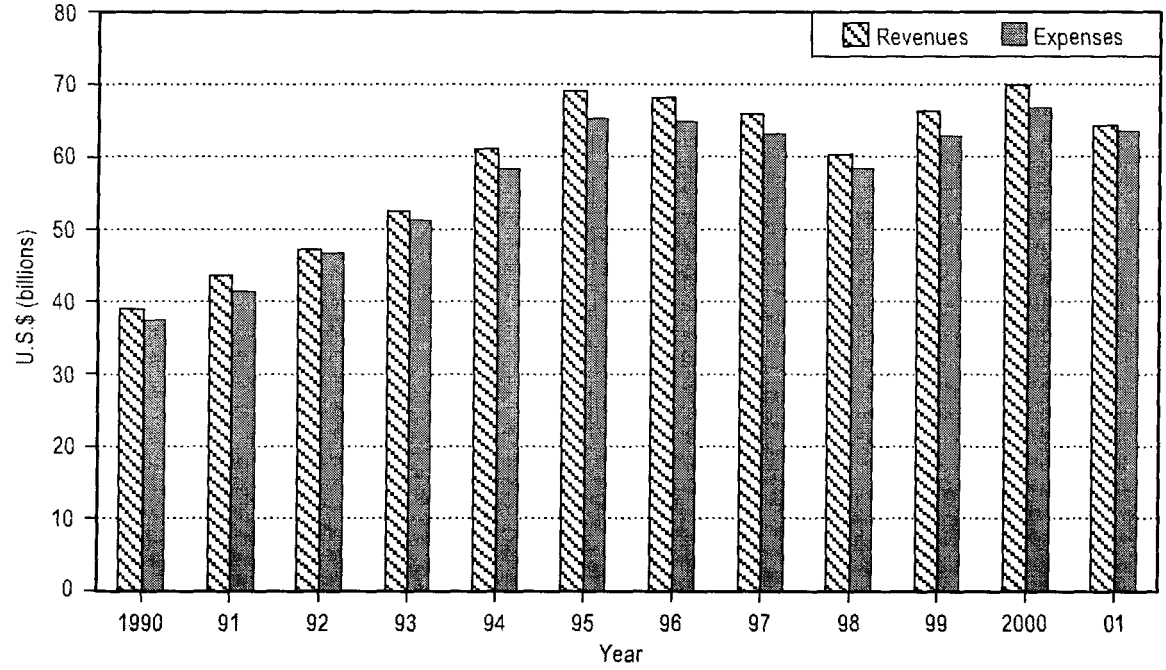
Source: IMF, WEFA Group.

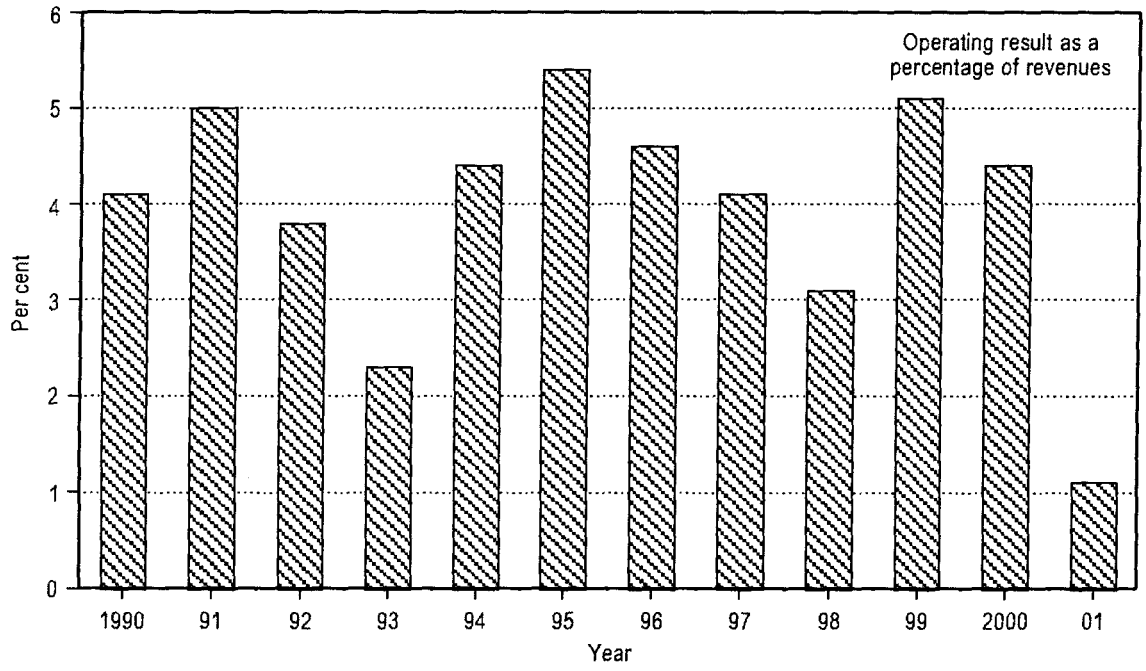
Figure 6-5. Annual change in real GDP and GDP per capita — Asia/Pacific (1990–2004)

6.17 Average scheduled passenger yields for airlines of the region, measured in terms of cents per PKP, have fluctuated significantly since 1990 and resulted in an annualized decline of 4.7 per cent during the 1990–2000 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

6.18 Over the 1990–2000 period, scheduled passenger traffic (in PKPs) of airlines of the Asia/Pacific region increased at the average annual rate of 7.9 per cent, significantly higher than the world's annual average of 4.8 per cent. Having exhibited the highest growth rates among all ICAO regions for almost a decade, in 1998 airlines of the region experienced a decline in traffic of 2.8 per cent, dampening the world traffic growth which averaged a low of 2.1 per cent. As a result of the speedy economic recovery in the Asian economies affected by





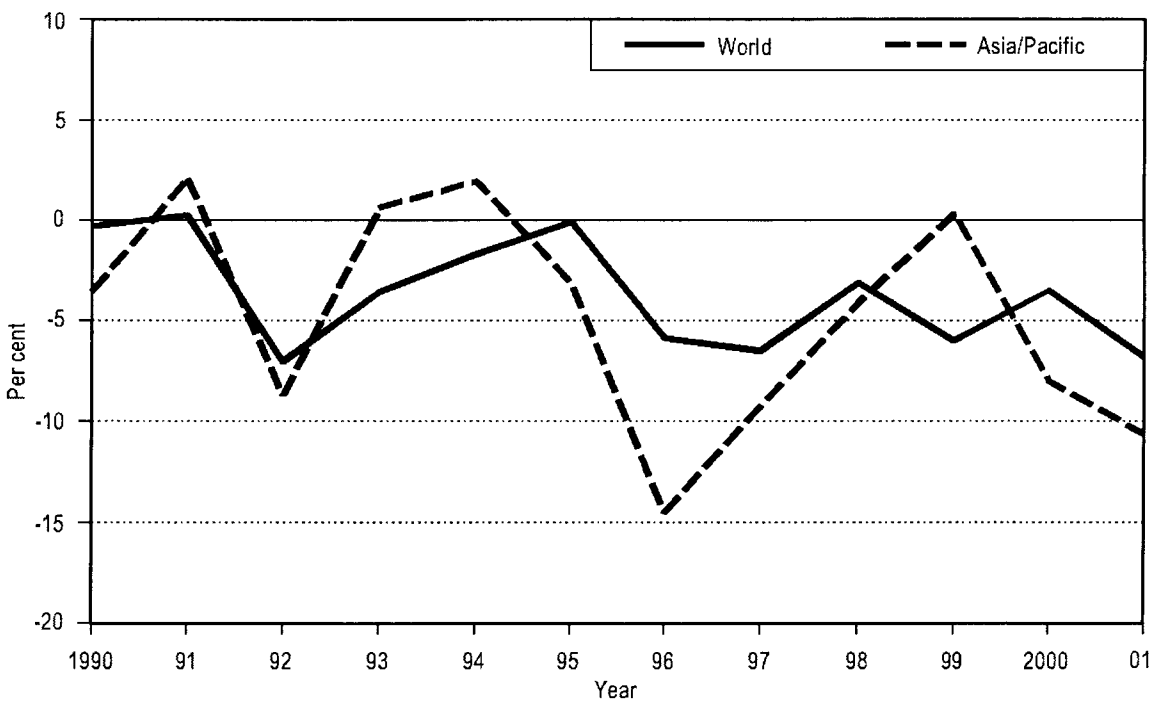
Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-6. Scheduled airline operating revenues and expenses — Asia/Pacific (1990-2001)

the 1997/1998 recession, and revived demand for air travel and freight, traffic increased by 7.0 and 10.0 per cent in 1999 and 2000, respectively. In 2001, total passenger traffic is estimated to have stalled at 0.1 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.

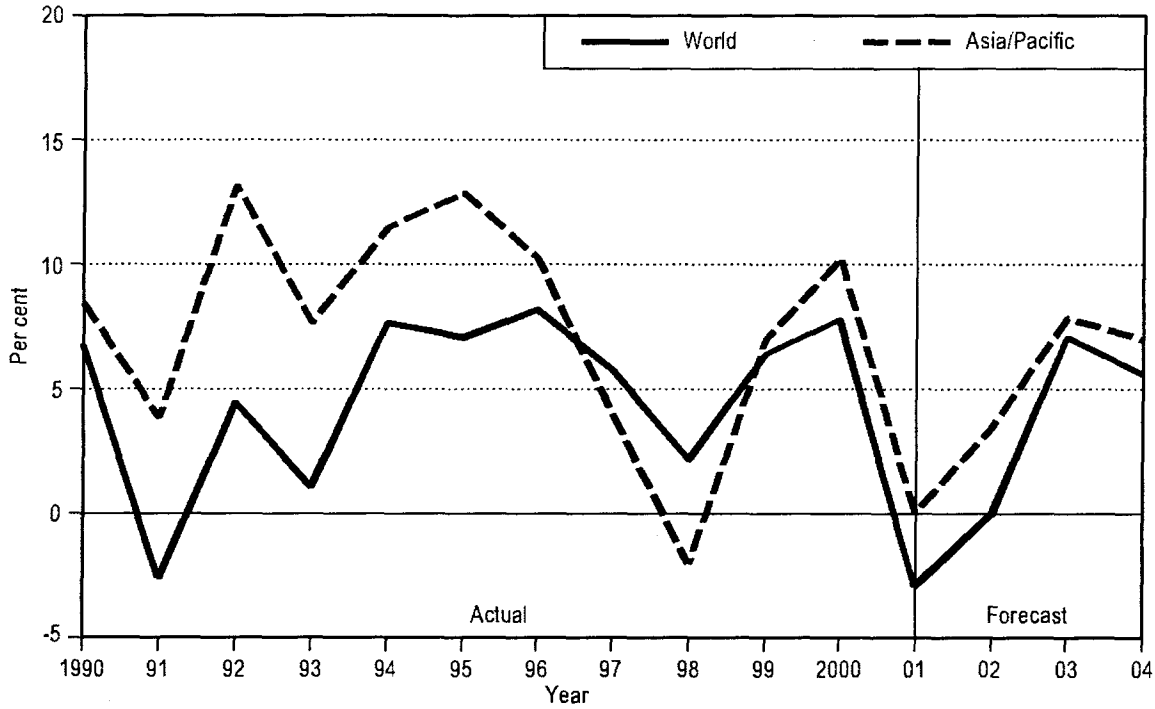
6.19 As shown in Table 5-6 and illustrated in Figure 6-8, scheduled passenger traffic of the airlines of the Asia/Pacific region is expected to grow at rates of 3.5, 7.9 and 7.0 per cent for the years 2002, 2003 and 2004, respectively, compared to the world airline growth of 0, 7.1 and 5.6 per cent.



Notes.— 2001 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-1.

Figure 6-7. Annual change in real scheduled passenger yield — Asia/Pacific and World (1990–2001)



Source: ICAO.

Figure 6-8. Scheduled passenger traffic growth (PKPs) — Asia/Pacific and World (1990–2004)

EUROPE

The region in 2001

Table 6-3. Scheduled traffic — Airlines of Europe (2001/2000)

	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	262 180	0.9	49.3	429 290	0.7	26.5
Passenger-kilometres performed (millions)	659 130	-2.9	38.4	787 410	-2.1	26.9
Freight and mail tonne-km performed (millions)	32 700	-6.4	33.5	33 660	-6.3	29.0

Source: ICAO Air Transport Reporting Form A.

6.20 The ECAC Safety Assessment of Foreign Aircraft Action Programme was fully operational during the year. The ECAC Task Force on Safety Oversight Issues developed a European position on the continuation of the Universal Safety Oversight Audit Programme (USOAP) and its extension to airports and air traffic management, covering also funding arrangements. The Task Force considered the safety oversight implications for ECAC States resulting from ICAO audits, and in December the ECAC Directors General confirmed that a "Safety Oversight Forum" would be held.

6.21 A study was conducted under ECAC guidance on the implications of the projected increase in air traffic demand on the capacity of the air navigation system in Europe. Its findings confirmed a growing mismatch between supply and demand and advocated closer cooperation amongst major stakeholders, i.e. regulators, airports, airlines, and air navigation services providers. In March 2001, ECAC hosted a Collaborative Forum of Stakeholders to present the findings. In December the Forum assembled to consider sustainable solutions for capacity problems of air transport services in Europe, which had been researched also by a high-level task force under the auspices of the Air Transport Action Group, a coalition of broad-ranging organizations and businesses from civil aviation and related industries.

6.22 As a follow-up to the 1999 ECAC/EC Dialogue on Airport Capacity, policy guidelines on the optimization of the use of existing airport capacity and the creation of future airport capacity were developed by the Task Force on Airport Capacity, taking into account such issues as pricing mechanisms, the economic, social and environmental impact of increased airport capacity, trans-European networks, the impact of alliances, slot allocation and the role of intermodality. Directors General adopted the report in June 2001.

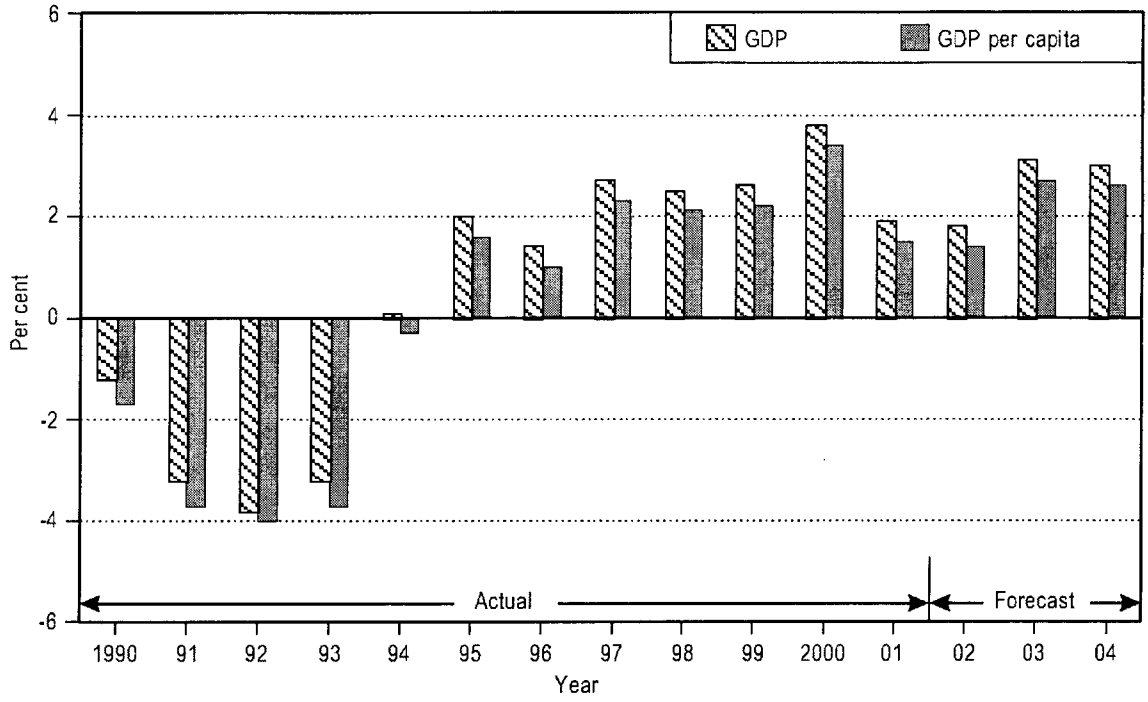
6.23 A fourth ECAC/EC Dialogue with air transport industries took place in May 2001 in Lisbon, Portugal, dealing with air passenger rights. To raise the quality of passenger services, this Dialogue considered voluntary commitments which had been made earlier by Europe's airlines and airports under joint ECAC/EC moderatorship. The target date for implementation of the Airline and Airport Voluntary Commitments was set for 14 February 2002, when ECAC would publicize the scheme together with a list of participating airlines and airports. Mechanics for monitoring the implementation of these Commitments are being developed.

6.24 Concerning environmental issues, ECAC presented the European policy position regarding noise and engine emissions at the 33rd ICAO Assembly in September 2001, initiated work on a standard aircraft emissions calculation method consistent with international practices, developed an environmental clause for inclusion in bilateral agreements, and intensified contacts with the Russian Federation regarding noise levels and standards.

6.25 In ECAC Member States, work continued on enhancing the overall security levels, and progress was made towards the introduction of screening 100 per cent of checked baggage. The vast majority of ECAC Member States report themselves as being on course to achieve the target date of 31 December 2002 as agreed by ECAC Directors General. Following 11 September, three specialized task forces were set up by ECAC to enhance security measures on the ground (particularly screening of passengers and cabin baggage) and in the air (locking of cockpit doors, deployment of in-flight security personnel and maintenance of aeroplane/ground communications and ATM aspects of a crisis). Their work covered developing quality control schemes to be adopted by ECAC Member States and is being considered by the respective EC authorities. The ECAC Security Audit Programme was fully operational in 2001. Voluntary audits were carried out at airports in Brussels (Belgium), Vilnius and Palanga (Lithuania), Oslo (Norway), Rinas (Albania) and Katowice (Poland). Three training courses for ECAC AVSEC auditors were organized by the European Aviation Security Training Institute (EASTI) in 2001, and 23 auditors were certified.

6.26 Work continued on the Facilitation Information System on Illegal Immigration (ECFALIS). On 1 April 2001, a voluntary ECFALIS pilot project started to test the new information system. Cargo facilitation, information and assistance to victims of aviation accidents, and the use of smart cards as well as electronic ticketing were also tackled. Work was initiated on the application of biometrics technologies, initially with the aim of enhancing air transport facilitation but now also as possible instruments to reinforce security measures.

6.27 Within the framework of its Integration Programme, ECAC organized seminars and workshops for recently joined Member States. A number of visits to those States by the Integration Officer identified needs and means for assistance and cooperation. As part of the follow-up, multilateral training sessions were organized in coordination with Member States and international organizations concerned, such as the Joint Aviation Authorities. The Commission also continued its partnership initiatives and dialogues with other regional Commissions, namely ACAC, AFCAC and LACAC.



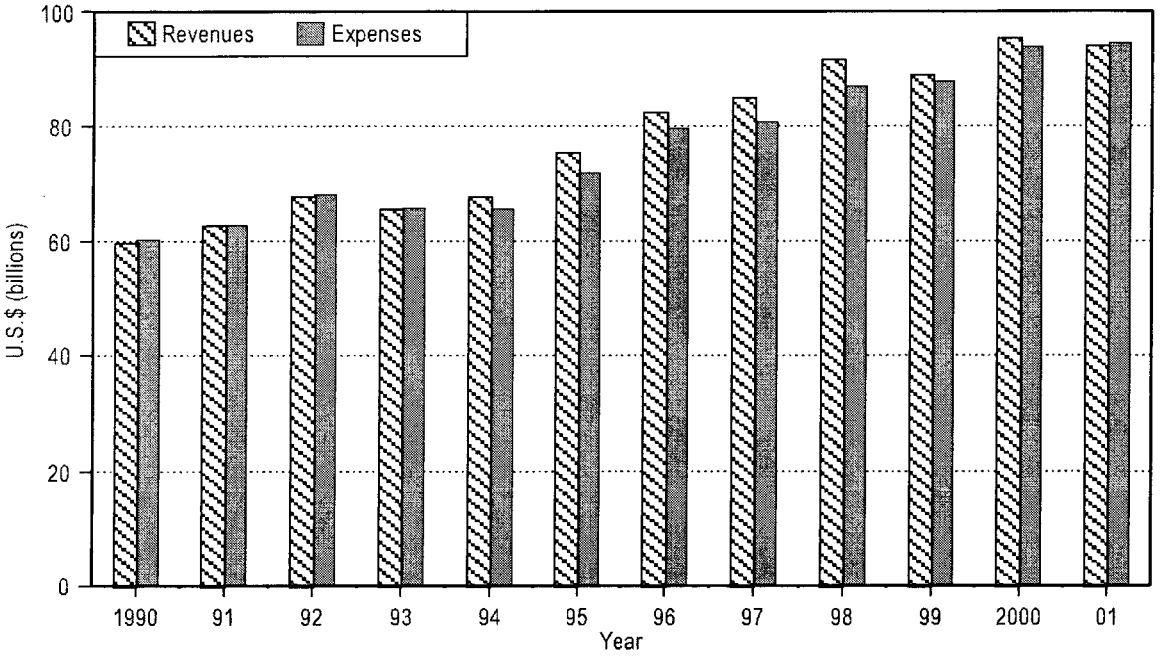
Source: IMF, WEFA Group.

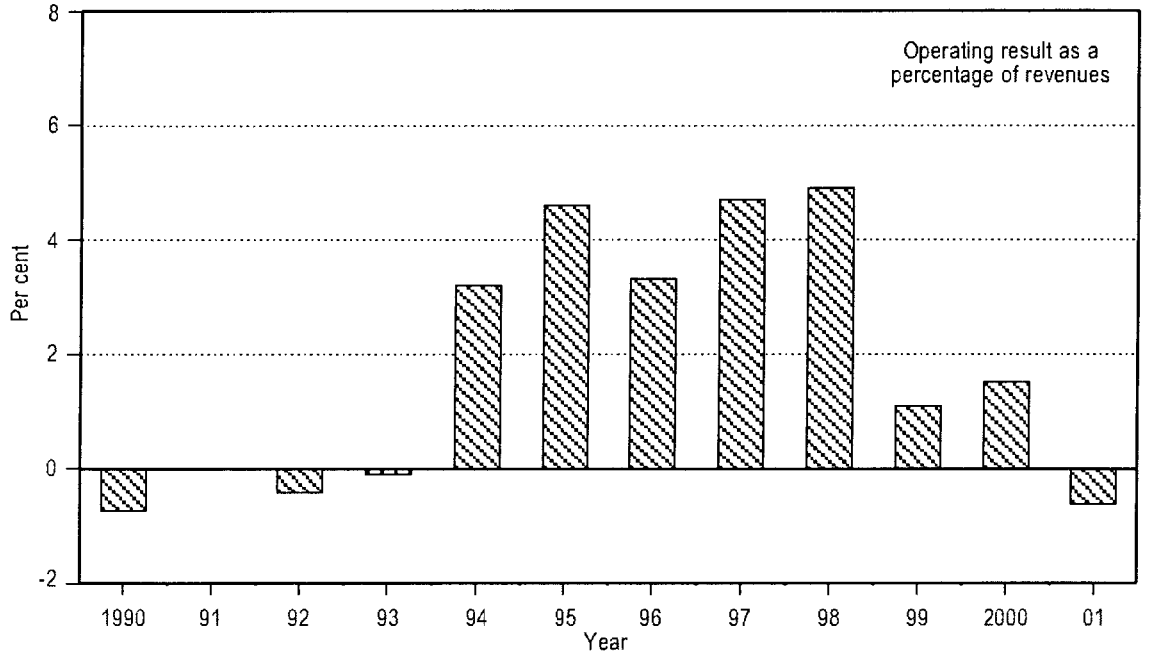
Figure 6-9. Annual change in real GDP and GDP per capita — Europe (1990–2004)

Economic trends

6.28 Following continuous economic growth, GDP grew throughout the 1980s, but 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. This zero economic growth masked a persistent divergence between countries in Western and Eastern Europe. Over the 1990–2000 period, the economies in the entire region (including the CIS), measured in real-term GDP, grew at an average annual rate of 0.5 per cent, with a growth rate of about 0.1 per cent for the aggregate GDP per capita. Figure 6-9 illustrates the annual changes in European GDP and GDP per capita.

6.29 The slowdown of growth in the Western European economies in 2001 from 3.4 to 1.7 per cent was felt also by their trading partners. Central and Eastern European countries experienced a slower growth pace that year. Following an impressive improvement in the previous years, the economic performance of the CIS was more moderate in 2001, particularly





Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-10 Scheduled airline operating revenues and expenses — Europe (1990–2001)

in Russia. The aggregate European economy is expected to grow at 1.8 per cent in 2002 and to improve slightly for 2003 and 2004, with GDP growth of 3.1 per cent and 3.0 per cent, respectively.

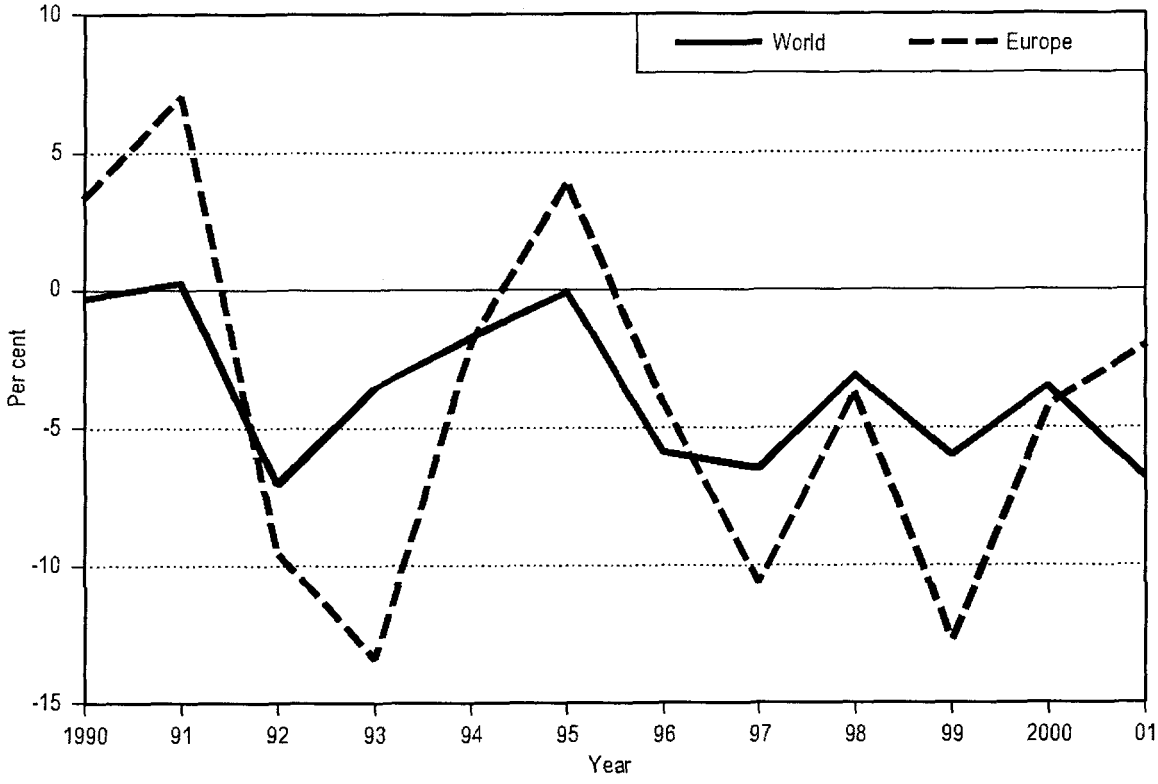
Airline financial trends

6.30 Over the 1990–2000 period, operating revenues of the scheduled airlines of the European region (excluding operations within the CIS) increased at an average annual rate of 4.7 per cent (compared to the world annual average rate of 5.1 per cent). Operating expenses for the same period increased by 4.5 per cent per annum. As illustrated in Figure 6-10, positive operating results were achieved during the period except for the years 1990, 1992, 1993 and 2001 when operating losses were incurred. For the first time since 1989, net profits were earned in 1994. After that, profitability in the European airline industry improved progressively with net profits at 3.7 per cent for 1998. However, 1999 witnessed a drop in net profits to 1.9 per cent. The operating result declined to some $1.4 billion or about 1.5 per cent of revenues in 2000. By 2001, it had deteriorated further and is estimated at a loss of $0.6 billion.

6.31 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 1990–2000, the annualized ten-year average showed a 5.1 per cent decline in yield, higher than the world result of a 3.7 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 (see Chapter 1). A further decline in yields expressed in real terms was witnessed in 1999 and 2000 due to the depreciation of European 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.

Airline passenger traffic trends and forecast

6.32 Over the 1990–2000 period, scheduled passenger traffic (in PKPs) of the airlines of the European region increased at an average annual rate of 3.1 per cent (compared to the world annual average of 4.8 per cent) despite a generally impressive performance in Western Europe (except in 1991). If airlines of the CIS are excluded, European traffic grew at 8.0 per cent per annum over the period. Reported CIS traffic volumes dropped dramatically, on average by 14.0 per cent each year over the last decade, with PKPs in 2000 at only about 22 per cent of those in 1990, but this declining trend ended in 2001 and for the first time in



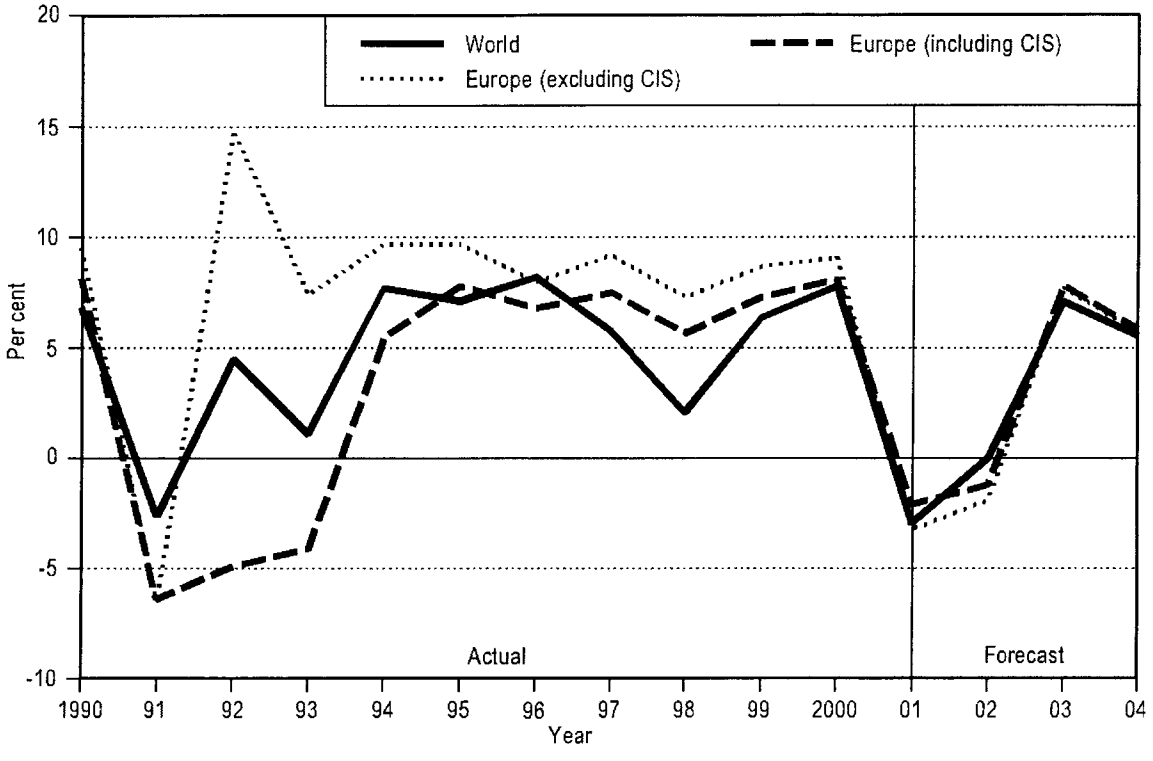
Notes.— 2001 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

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

Figure 6-11. Annual change in real scheduled passenger yield — Europe and World (1990-2001)

the decade the CIS total passenger traffic volume showed a positive growth estimated at 13.7 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.

6.33 As shown in Table 5-6 and illustrated in Figure 6-12, scheduled passenger traffic for the region as a whole is expected to decline by 1.2 per cent in 2002 and to grow annually at rates of 7.8 and 5.9 per cent for the years 2003 and 2004, respectively (compared to world airline growth of 0, 7.1 and 5.6 per cent). The airlines of Europe, excluding the CIS, are expected to follow the same pattern over the forecast period as also illustrated in Figure 6-12, while traffic volumes for the CIS are expected to continue to grow steadily.



Source: ICAO.

Figure 6-12. Scheduled passenger traffic growth (PKPs) — Europe and World (1990–2004)

MIDDLE EAST

The region in 2001

Table 6-4. Scheduled traffic — Airlines of the Middle East (2001/2000)

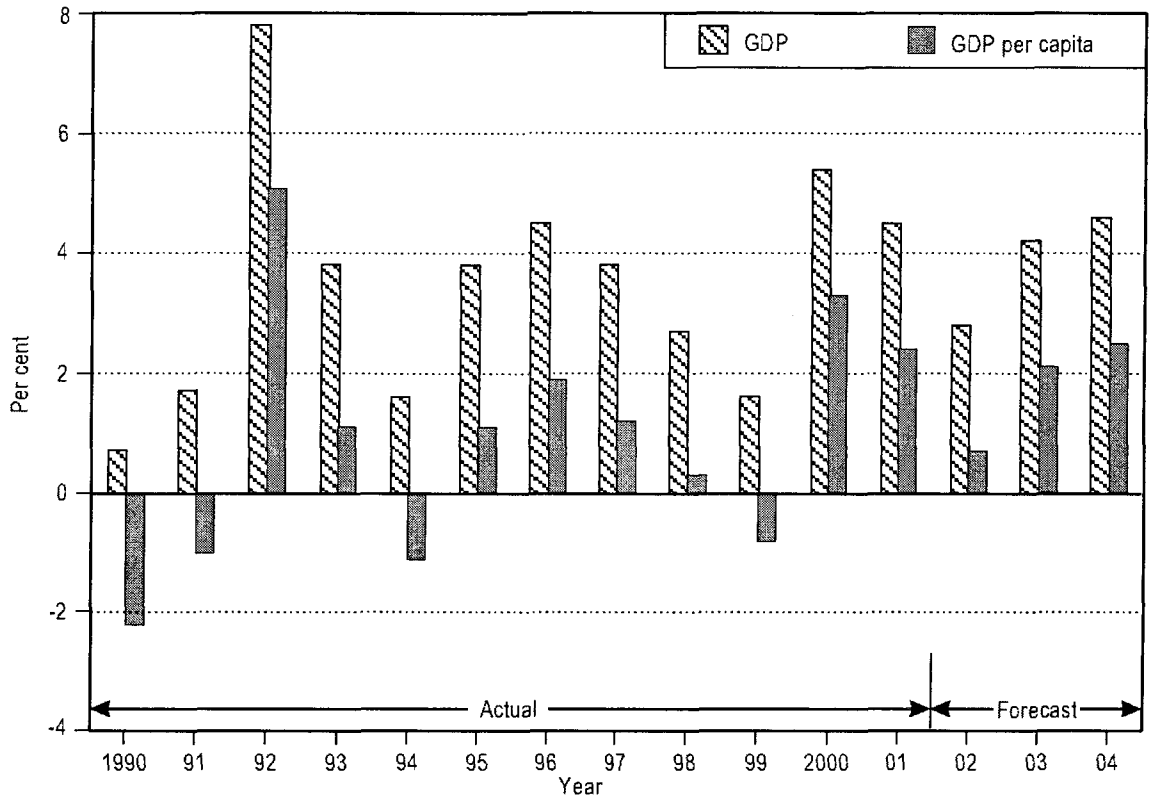
	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	27 610	0.6	5.2	45 510	2.1	2.8
Passenger-kilometres performed (millions)	84 140	2.9	4.9	96 840	3.2	3.3
Freight and mail tonne-km performed (millions)	4 570	-0.4	4.7	4 670	-0.4	4.0

Source: ICAO Air Transport Reporting Form A.

6.34 Air transport liberalization was gradually implemented on a bilateral basis among ACAC Member States, starting with non-scheduled passenger as well as freight traffic. The Air Transport Committee of ACAC had proposed a multilateral framework for the liberalization of the exchange of traffic rights among Arab States which was approved by policy-making organs of the Commission as well as by political authorities of Arab States under the auspices of the League of Arab States (LAS) in March 2002 in Beirut, Lebanon, including the Economic and Social Council of LAS and the 14th Summit of Heads of States and Governments. Work also commenced on harmonization of various national legislations pertaining to civil aviation in the region.

Economic trends

6.35 The Middle East economy has been characterized by several pronounced cycles over the past decade, as illustrated in Figure 6-13 which presents the year-to-year changes in the region's GDP and GDP per capita over the 1990–2000 period. While oil-producing countries had suffered from declines in crude oil prices during the 1980s, 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. Continuous growth, though varying in strength, was sustained for the following seven years. From 1990–2000, the aggregate GDP for the Middle East grew at an average annual rate of 3.7 per cent in real terms, while GDP per capita averaged a 1.1 per cent growth rate per annum. In 2001, the economy of the region was still strong with 4.5 per cent real GDP growth, the highest rate of all regions. Nevertheless this was a slowdown over the previous year considering that the 6.4 per cent boost was due to higher oil prices combined with increased oil production.



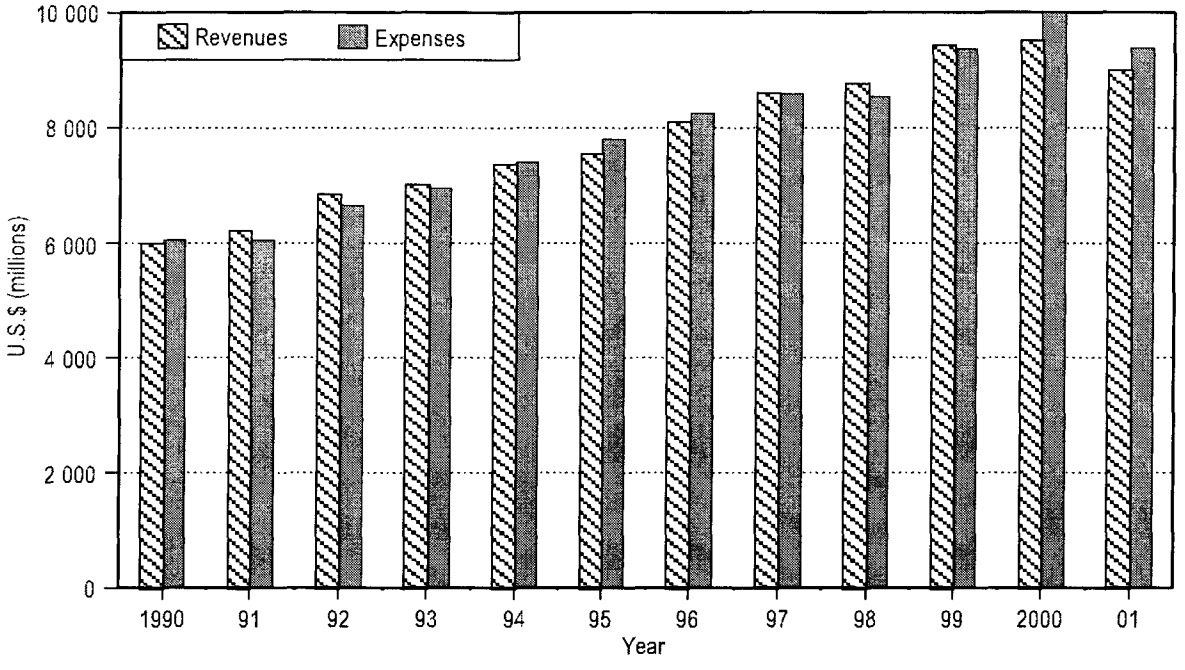
Source: IMF, WEFA Group.

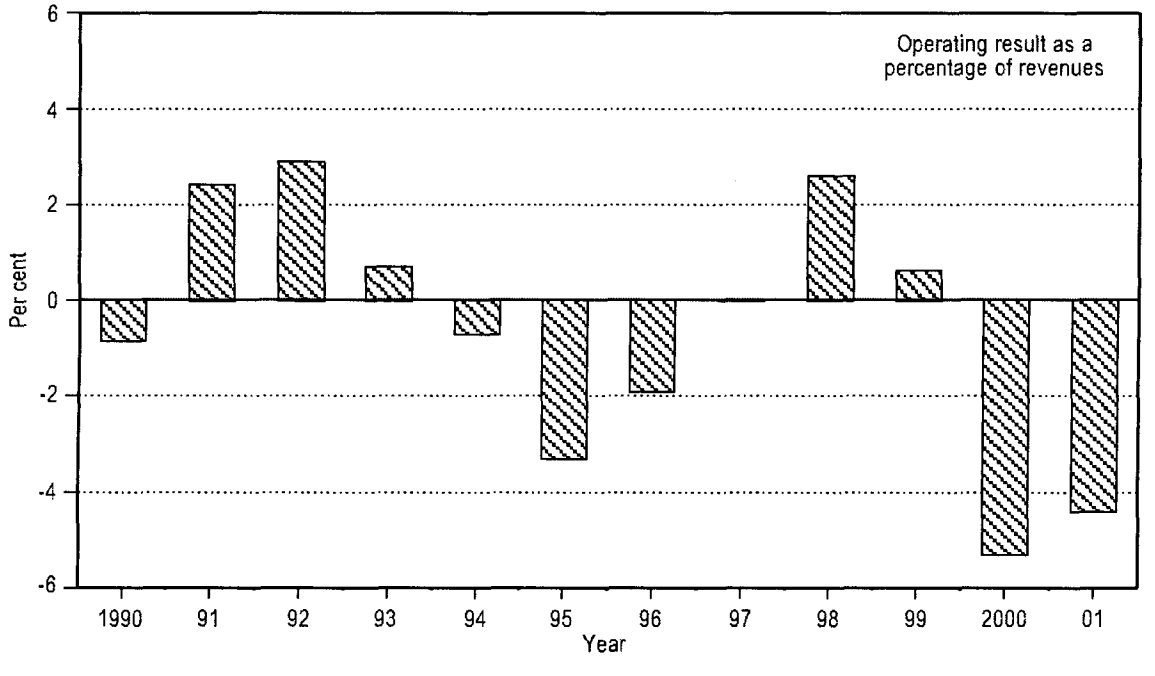
Figure 6-13. Annual change in real GDP and GDP per capita — Middle East (1990–2004)

6.36 The projected moderate decline in oil prices during the forecast period appears to be generally manageable by the Middle-East economies, partly due to gains from higher oil prices in the previous years. These economies are expected to grow, in aggregate, at 2.8, 4.2 and 4.6 per cent in 2002, 2003 and 2004, respectively. This projection assumes a prudent approach to fiscal policies, especially in those countries where government debts need to be reduced, and reforms to increase economic diversification and growth need to be continued.

Airline financial trends

6.37 Over the 1990–2000 period, operating revenues of the scheduled airlines of the Middle East region increased at an average annual rate of 3.7 per cent (compared to the world annual average of 5.1 per cent). Operating expenses for the same period increased by 4.2 per cent per annum. As shown in Figure 6-14, since 1994 the airlines in the region have





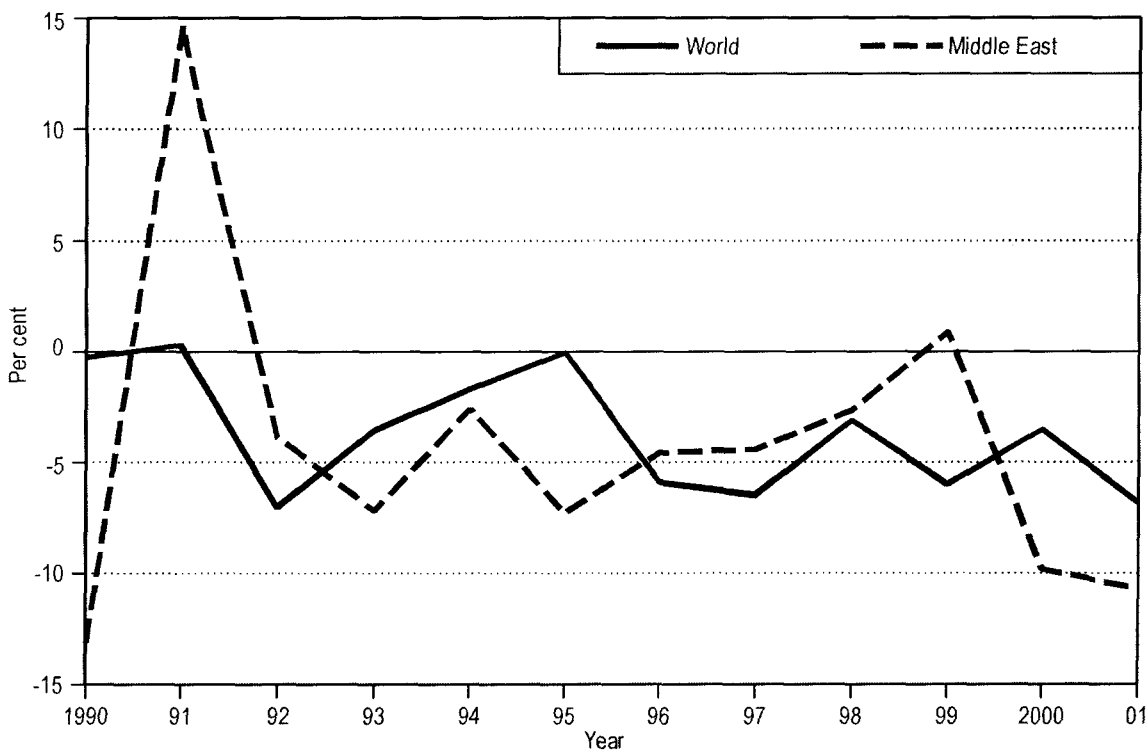
Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-14. Scheduled airline operating revenues and expenses — Middle East (1990–2001)

experienced a string of operating losses, except for 1998 and 1999. Traffic has grown continuously, but capacity expansion has been even greater and unit costs remain comparatively high.

6.38 For the 1990–2000 period, average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP, declined at an average annual rate of 2.9 per cent in real terms (compared to a 3.7 per cent decline for the world), with an exceptional increase in 1991. Real yield decreased substantially in 2000 and 2001 by some 10 and 11 per cent, respectively, resulting from a marked increase in traffic and a very small increase in revenues. The year-to-year comparisons of the changes in real passenger yields of Middle East and world airlines are illustrated in Figure 6-15.



Notes.— 2001 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

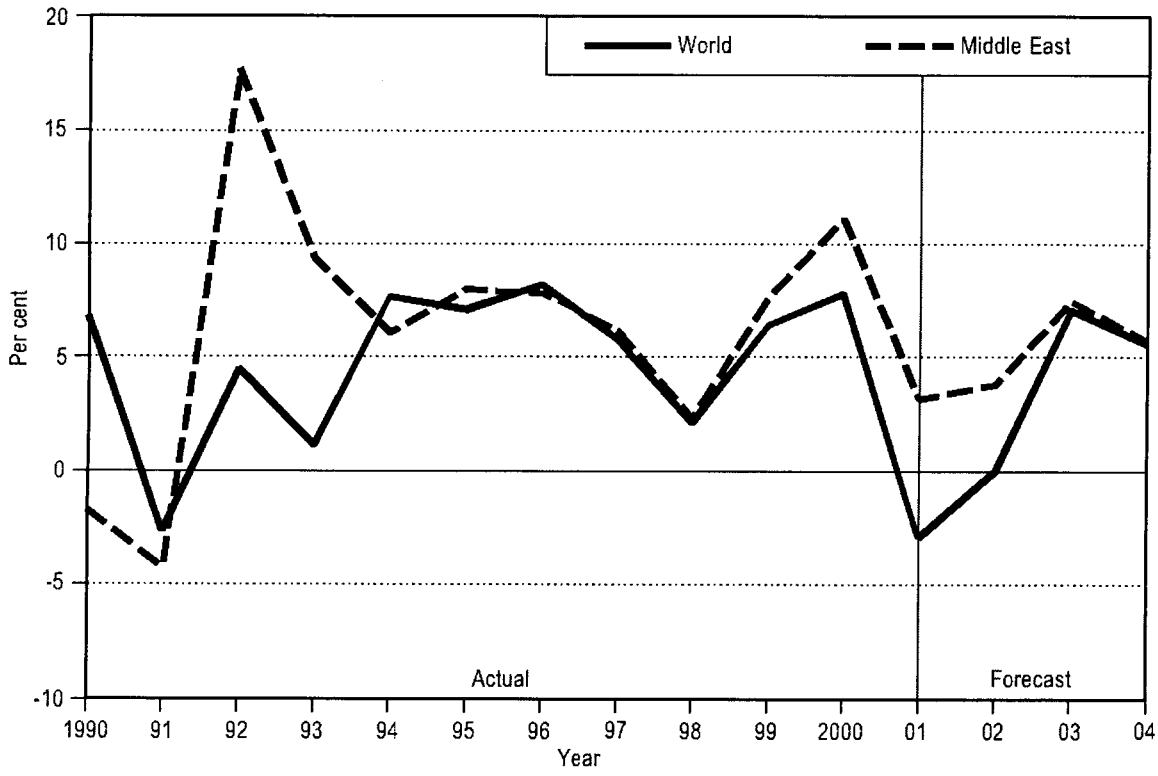
Source: ICAO Air Transport Reporting Forms A and EF-1.

Figure 6-15. Annual change in real scheduled passenger yield — Middle East and World (1990–2001)

Airline passenger traffic trends and forecast

6.39 Over the 1990–2000 period, scheduled passenger traffic (in PKPs) of the airlines of the Middle East region increased at an average annual rate of 7.2 per cent. Traffic growth has been reasonably buoyant since the declines in 1990 and 1991 associated primarily with the Gulf War. After an impressive growth of 11.0 per cent in the year 2000, total passenger traffic grew only by 3.2 per cent in 2001. 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.

6.40 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 3.8 per cent per annum in 2002, 7.5 per cent in 2003 and 5.7 per cent in 2004. These rates reflect expectations of a good economic performance in the region.



Source: ICAO.

Figure 6-16. Scheduled passenger traffic growth (PKPs) — Middle East and World (1990–2004)

NORTH AMERICA

The region in 2001

Table 6-5. Scheduled traffic — Airlines of North America (2001/2000)

	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	75 950	-6.0	14.3	641 780	-6.5	39.6
Passenger-kilometres performed (millions)	331 030	-6.3	19.3	1 108 780	-5.7	37.8
Freight and mail tonne-km performed (millions)	19 710	-7.3	20.2	32 440	-8.8	28.0

Source: ICAO Air Transport Reporting Form A.

6.41 The already weakened operating climate for air transport services during 2001 worsened with a slowdown of the world economy coupled with a steep traffic decline and sharply rising costs triggered by the aftermath of 11 September. The sudden and dramatic drop in demand for air travel resulted in revenue and job losses at airlines, airports, providers of airline-support products and, in turn, at aircraft manufacturers and their suppliers. Air carriers registered in North American plunged into one of the worst crises since the emergence of air transport as one of the fastest growing industries. Other industries, including tourism, financial services and a host of international trading partners, were also directly or indirectly affected by the downturn of civil aviation industries.

6.42 Considering the emergency situation following September 2001, governments concerned had to intervene quickly to enable their national airline industries to manage their sudden, event-related financial crisis and stabilize the economy. A reduction in labour income means lower consumer spending which will further the contraction in demand and subsequently in output throughout an economy, affecting also consumer industries. Consequentially, tax revenues from corporations and private households decline which does not necessarily lead to reduced government spending in an economic slowdown. The massive revenue losses and sharp increase in operational costs (e.g. intensified security measures) of airlines were intermittently dampened by governmental financial aid to avoid pushing major carriers into bankruptcy. United States' airlines were allocated $15 billion financial assistance, including a cash grant of $5 billion, under the Air Transportation Safety and System Stabilization Act. The Canadian Government granted a $102 million bailout to their major air carriers to compensate for the shutdown of North American airspace following 11 September.

6.43 Airports and air navigation services providers also suffered financial problems. They lost income from aeronautical user charges (mainly landing, parking and air navigation charges) due to the reduction in aircraft movements, passenger service charges and non-aeronautical revenues due to the passenger traffic decline. Like airlines, airports were burdened with additional costs for insurance coverage and premiums, although on a smaller scale, and compliance with heightened security standards required for terminal buildings and other airport facilities.

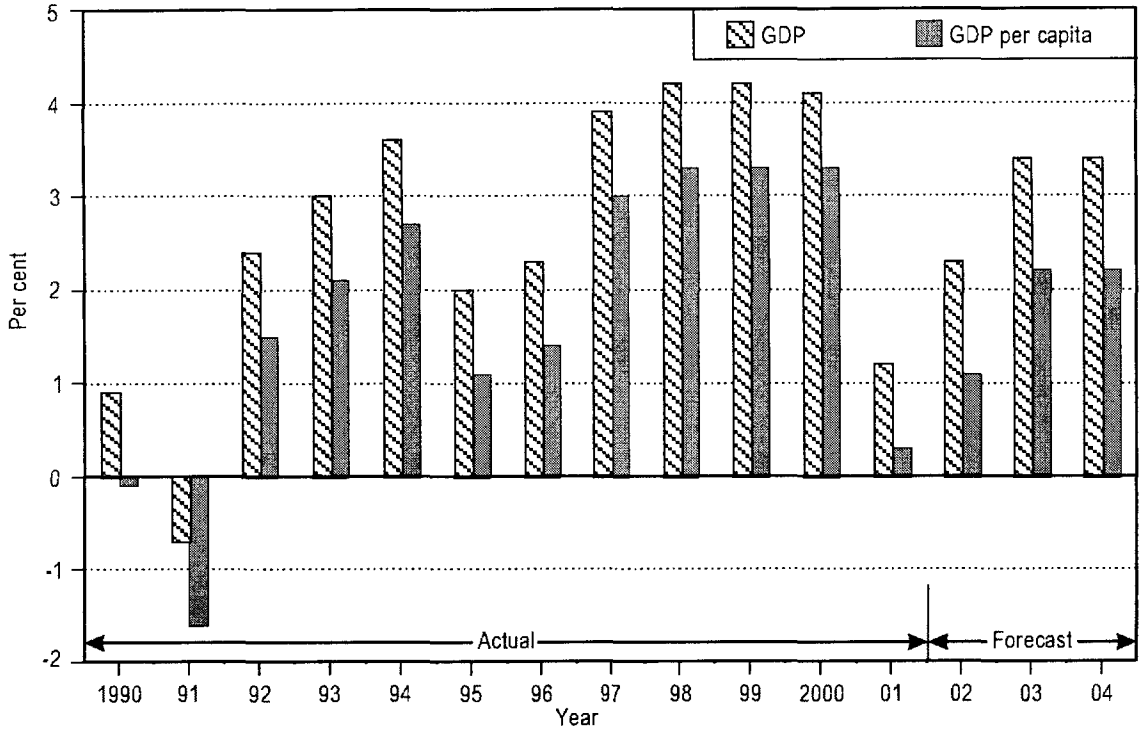
6.44 Through Air Canada's acquisition of Canadian Airlines in 2000, the route network of the largest national carrier extended for domestic, trans-border and other international air services. The acquisition necessitated the revision of several air services agreements by Transport Canada and counterpart governments concerned. Other regulatory action taken by Transport Canada included a bilateral international air services agreement allowing flights originating in Aruba to any destination in Canada under a liberal pricing regime. Furthermore, it amended an MoU with Iceland, permitting Icelandair to increase service frequency to Halifax, Nova Scotia, and possibly to add other destinations in Canada, and concluded new agreements with Poland, Spain and Chile. The Canadian Government passed legislation on air carrier ownership which removes the fifteen per cent limit for individual shareholders of Air Canada, *inter alia*, as incentive for private-sector investors. A limit of 25 per cent remains for acquisition of shares with voting rights to be held collectively for foreign ownership.

6.45 Transport Canada launched a review of its international air policy among stakeholders with the objective of further liberalizing scheduled international air services with a broader exchange of rights and less regulation. This review covers the government's strategy for negotiating bilateral air services agreements and managing Canadian air traffic rights with the respective foreign authorities. Addressing the international air policy issues was disrupted as Transport Canada re-prioritized in light of the aftermath of 11 September and dealt with the rapidly emerging negative effects on the business and security conditions of Canadian air carriers. For instance, due to bankruptcy, Canada 3000 Airlines was forced to cease operations in November, although it had became the second largest Canadian airline after its corporate parent, Canada 3000 Inc., acquired Royal Aviation and CanJet.

Economic trends

6.46 Over the 1990–2000 period, the North America GDP grew at an average annual growth rate of 2.9 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 the Second World War. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-17.

6.47 The year 2000 still saw a robust GDP growth of 5.3 per cent for the North America region. However, by the end of 2000, an economic slowdown had started in the United States and continued to affect economic activities throughout 2001 with the worsening impact of the September events. The U.S. economy grew 1.2 per cent during 2001, down sharply from the



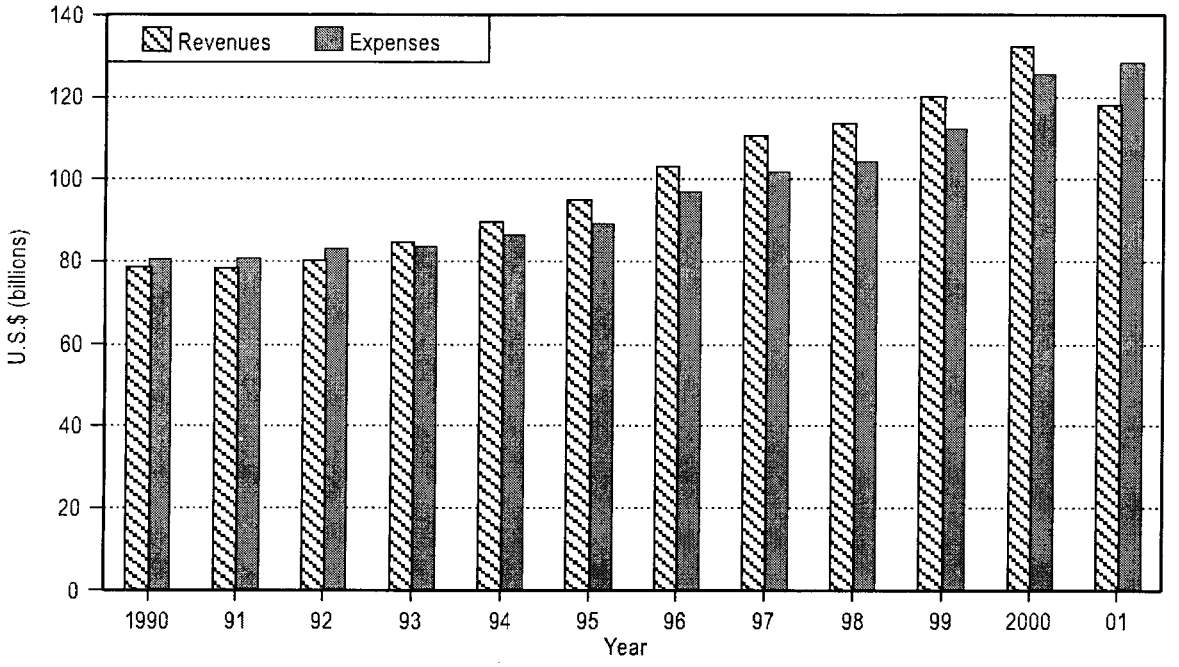
Source: IMF, WEFA Group.

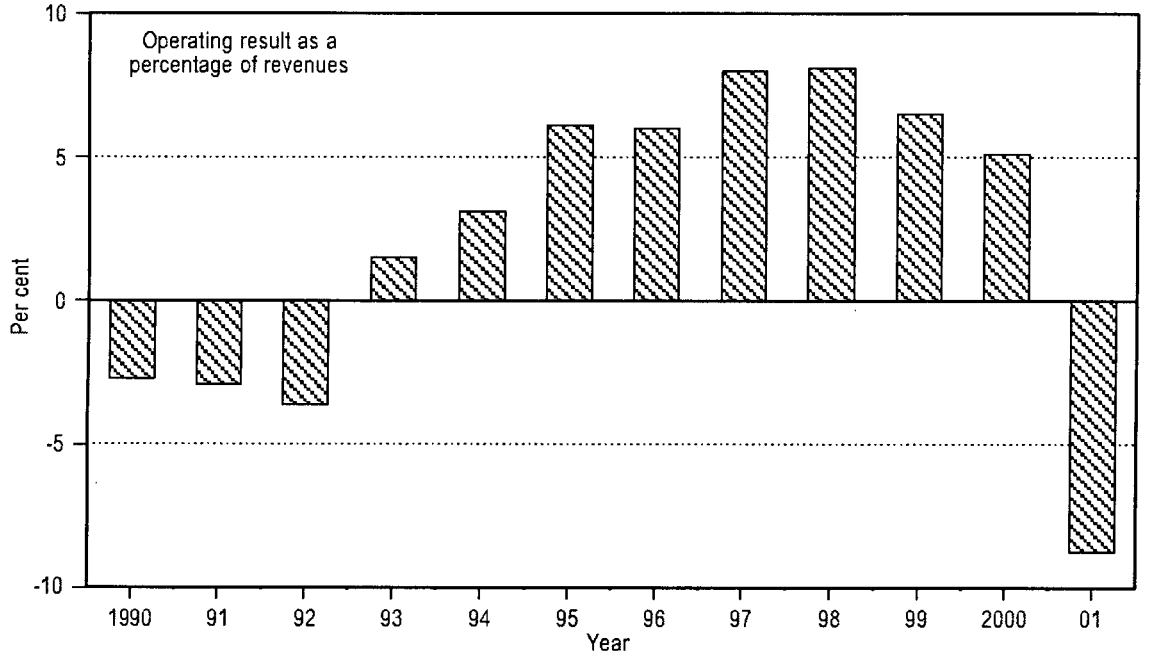
Figure 6-17. Annual change in real GDP and GDP per capita — North America (1990-2004)

4.1 per cent growth the previous year. It is expected that the region's economy will continue to slow down in the earlier part of 2002 but will rebound and is projected to grow at some 2.5 per cent during 2001, helped by lower short-term and long-term interest rates. A consolidation of the North American economy is expected for the remainder of the forecast period. The region's GDP is projected to grow at 3.1 and 3.5 per cent in 2003 and 2004, respectively. However, this outlook remains subject to considerable uncertainty and depends on how deep and prolonged the economic slowdown in the U.S. proves to be.

Airline financial trends

6.48 Over the 1990–2000 period, operating revenues of the scheduled airlines of the North American region increased at an average annual rate of 5.3 per cent (compared to the world annual average of 5.1 per cent). Operating expenses for the same period increased by 4.5 per cent per annum. The string of operating surpluses in the 1986–1989 period gave way to a three-year period of serious deficits. Starting in 1993, operating surpluses have





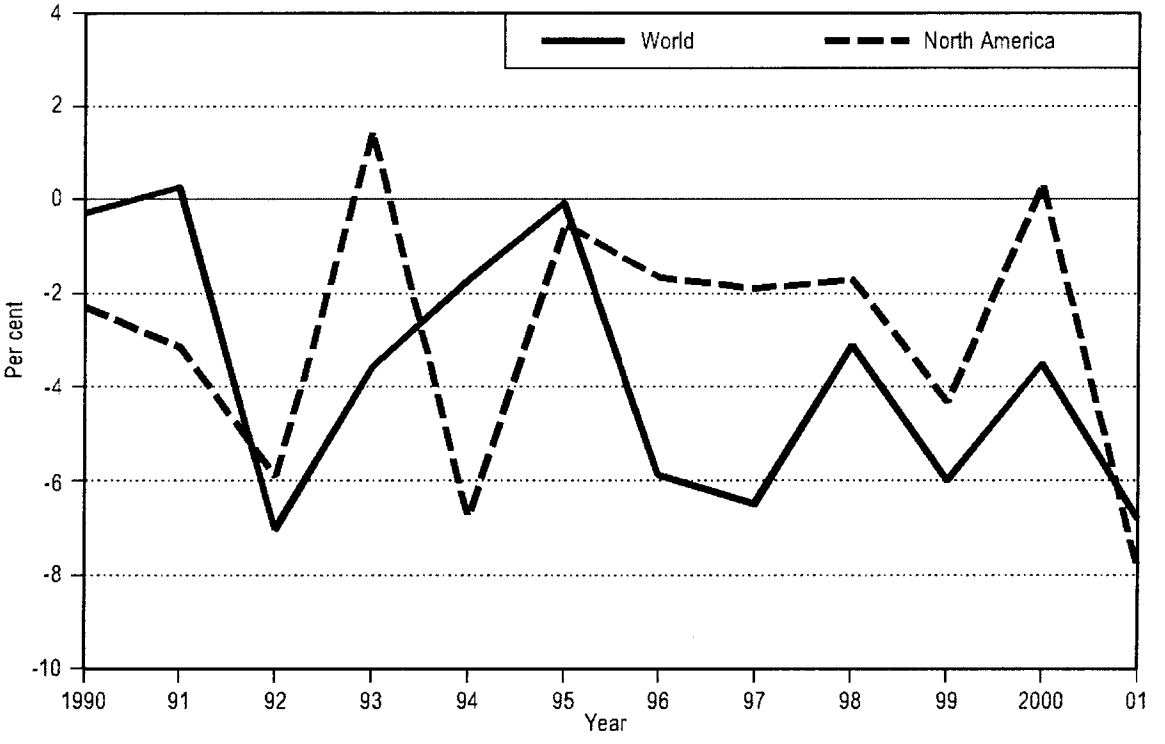
Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-18. Scheduled airline operating revenues and expenses — North America (1990–2001)

increasingly recovered and widened for seven consecutive years, as illustrated in Figure 6-18. For 2001, the airlines of the region were by far the most affected by the economic slowdown and the events of 11 September. The operating deficit experienced by these airlines is estimated at about $10 billion.

6.49 For the 1990–2000 period, average scheduled passenger yields for airlines of the region, measured in terms of U.S. cents per PKP, declined at an average annual rate of 2.4 per cent in real terms (compared to a 3.7 per cent decline for the world). In 2000, industry-wide real yield increased somewhat over the previous year, triggered by increases in fuel prices. However, it declined by 8 per cent in 2001, due mainly to the significant decline in demand and the resulting pressure on prices. 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.



Notes.— 2001 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

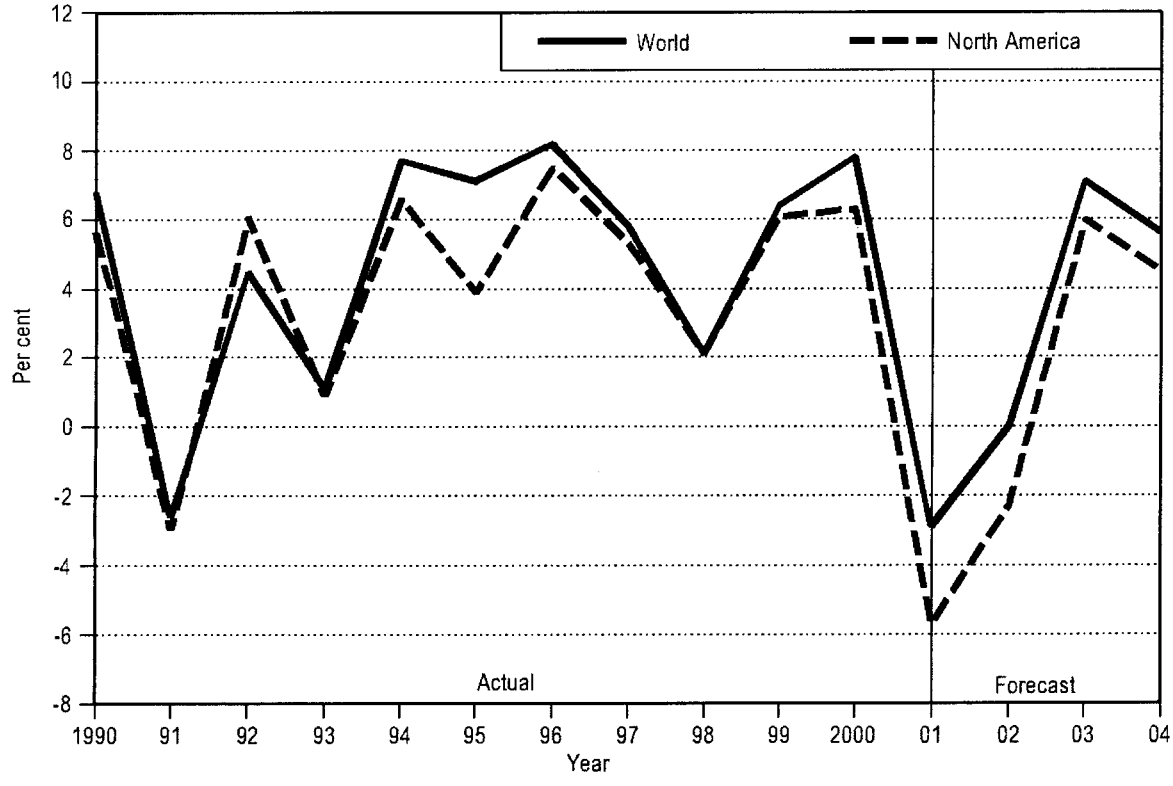
Source: ICAO Air Transport Reporting Forms A and EF-1.

Figure 6-19. Annual change in real scheduled passenger yield — North America and World (1990–2001)

Airline passenger traffic trends and forecast

6.50 Over the 1990–2000 period, scheduled passenger traffic (in PKPs) of the airlines of the North American region increased at an average annual rate of 4.1 per cent (compared to the world average of 4.8 per cent). The estimated decline in 2001 is 5.7 per cent, the highest among all other 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.

6.51 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 decline by 2.3 per cent in 2002 and to rebound by 6.0 per cent in 2003 and 4.5 per cent in 2004. Although the forecast rates for 2003 and 2004 are below the expected growth pattern for the world as a whole (7.1 and 5.6 per cent for the same three years), they represent impressive absolute growth considering the traffic volume of the region.



Source: ICAO.

Figure 6-20. Scheduled passenger traffic growth (PKPs) — North America and World (1990–2004)

LATIN AMERICA AND THE CARIBBEAN

The region in 2001

Table 6-6. Scheduled traffic — Airlines of Latin America/Caribbean (2001/2000)

	INTERNATIONAL			TOTAL		
	2001	Increase over 2000 (%)	Share of world traffic (%)	2001	Increase over 2000 (%)	Share of world traffic (%)
Passengers carried (thousands)	27 990	-8.0	5.3	97 010	-2.2	6.0
Passenger-kilometres Performed (millions)	78 680	-9.1	4.6	134 040	-5.5	4.6
Freight and mail tonne-kms performed (millions)	3 440	-9.0	3.5	4 210	-7.4	3.6

Source: ICAO Air Transport Reporting Form A.

6.52 Air transport authorities and airlines continued working on achieving directives given by the First Latin American Civil Aviation Summit as well as decisions taken by the 14th LACAC Assembly; both events had simultaneously been held during November 2000 in Santo Domingo, Dominican Republic. One of the Summit's directives led to the establishment of a Committee, comprised of five representatives from civil aviation authorities, two from regulatory bodies, three from airport operators and another five from airlines. This Committee was mandated to foster measures that would address: a) the service quality for air transport users; b) harmonization of a more flexible and compatible regional air transport policy; c) restrictions in national legislation on airline ownership; d) transparency in the framework establishing charges for airport and air navigation services; e) rules and operational procedures specifying the provider-customer relationship between operators and users of airport-based air transport services; f) duplication and overlapping responsibilities between civil aviation authorities and regulatory bodies; g) commercial agreements, e.g. via airline alliances, to accommodate joint procurement of aircraft, parts and other supplies as well as maintenance and repair; h) alleviation of the taxation burden on airlines; and (i) wider support from international organizations such as IATA and ICAO, including technical cooperation in civil aviation matters.

6.53 The aforementioned directives and decisions also provided a platform for the Air Transport Colloquium, which was jointly organized by ICAO, LACAC, the Inter-American Development Bank, IATA and the regional Asociación Internacional de Transporte Aéreo Latinoamericano, and held in August 2001 in Salvador de Bahia, Brazil. During this Colloquium new cooperative strategies and mechanisms were agreed in response to the crisis faced by air transport industries in the States of Latin America. Unfortunately, most of the momentum created for regional cooperation strategies through the First Summit in 2000

diminished in the face of the aftermath of the 11 September events. However, during the Summit of Ibero-American Heads of State, held in Lima, Peru, in November 2001, Latin American States launched a regional effort to strengthen measures agreed during recent regional consultations mentioned above. Furthermore, a Meeting of Ministers of Transport and Civil Aviation Authorities (CAAs) was scheduled for December 2001 in Cartagena, Colombia, to confer directly on these matters. As a result, transport ministers and CAA representatives agreed to take action regarding: a) the adoption of harmonized air transport policies; b) the adjustment of competition conditions in comparison to other regions; c) the permanent establishment of a forum for Ministers of Transport; and d) the creation of a regional mechanism for adopting well accepted solutions and developments.

6.54 Managerial activities of the airline industry in Latin American and the Caribbean were concerned with strengthening their position or surviving in face of a fiercely competitive international market, intensified by the economic slowdown and end-of-year slump in the USA. Internationally operating air carriers registered in Mexico (Mexicana, Aeromexico, Aeromexpress, Aerolitoral and Aerotransporte de Carga Union) enlarged their scope through codesharing and other commercial agreements signed with partner airlines of North America (Air Canada, United Airlines, Delta Airlines) and Europe (SAS, CSA Czech Airlines, Cargolux Airlines and Martinair Holland). Upon authorization of the Colombian Government, the "Summa" Alliance was created and since then controls a significant portion of the stakes, management and operations of Avianca-SAM and ACES (Colombian international airlines). In order to concentrate on profitable routes and efficient operations, airlines also needed streamlining of their route networks. Traditionally important destinations were reduced or eliminated by Avianca (services to Europe) and by Loyd Aereo Boliviano (services to Argentina, Cuba, Brazil and Uruguay). Also Air Jamaica together with other regional airlines of Caribbean States subscribed to codesharing and other commercial agreements in order to strengthen their coverage in the Caribbean market.

Economic trends

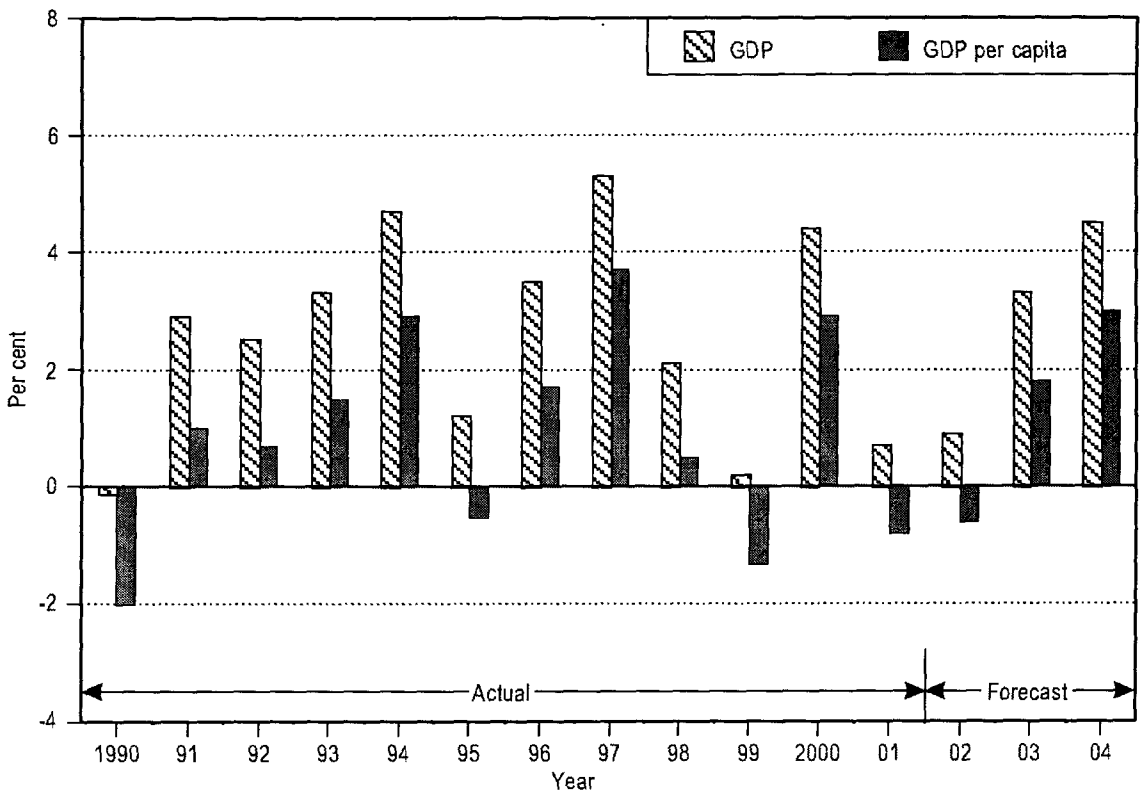
6.55 Over the 1990–2000 period, the aggregate Latin American and Caribbean economy (GDP) grew at an average annual rate of 2.6 per cent in real terms, whereas GDP per capita grew at 0.8 per cent. The economy in this region was severely affected by recession in the late 1980s, but a robust recovery started in 1991. The year-to-year changes in the region's GDP and GDP per capita are illustrated in Figure 6-21.

6.56 After a record 5.3 per cent growth in GDP in 1997, the regional economy declined to a 2 per cent growth in 1998 and further to a growth of only 0.2 per cent in 1999. The 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 their agriculture sector and industrial infrastructures and, consequently, declining exports and overall economic performance. The aggregate economic growth of Latin America rebounded in 2000 to 4.3 per cent, in part resulting from the implementation of strong adjustment measures in many countries.

6.57 It is expected that the aggregate growth of the Latin American economy will slow down in 2001 to about 3.8 per cent. The direct impact of weakening external demand on economic performance in the region will be significant for countries like Mexico and those of the Andean region and Central America but rather moderate for other countries. For 2002 and 2003, the region's aggregate GDP is projected to accelerate its growth to 4.4 and 4.5 per cent, respectively.

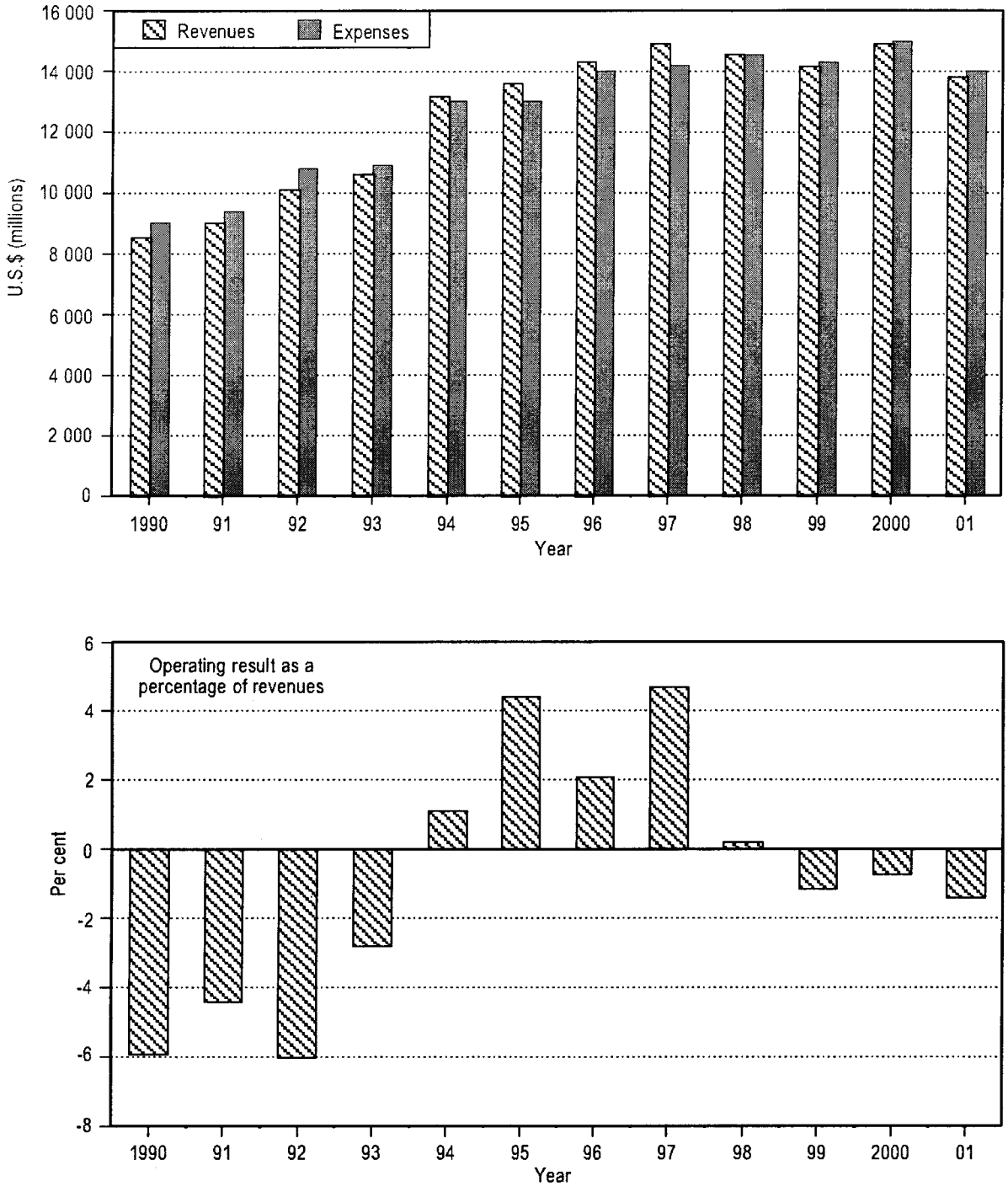
Airline financial trends

6.58 Over the 1990–2000 period, operating revenues of the scheduled airlines of the Latin America and Caribbean region increased at an average annual rate of 5.6 per cent (compared to the world annual average of 5.1 per cent). Operating expenses for the same period increased by 5.1 per cent per annum. The overall financial performance of the airlines of the region has been poor over the whole period with five consecutive years (1989 to 1993) of



Source: IMF, WEFA Group.

Figure 6-21. Annual change in real GDP and GDP per capita — Latin America and the Caribbean (1990–2004)



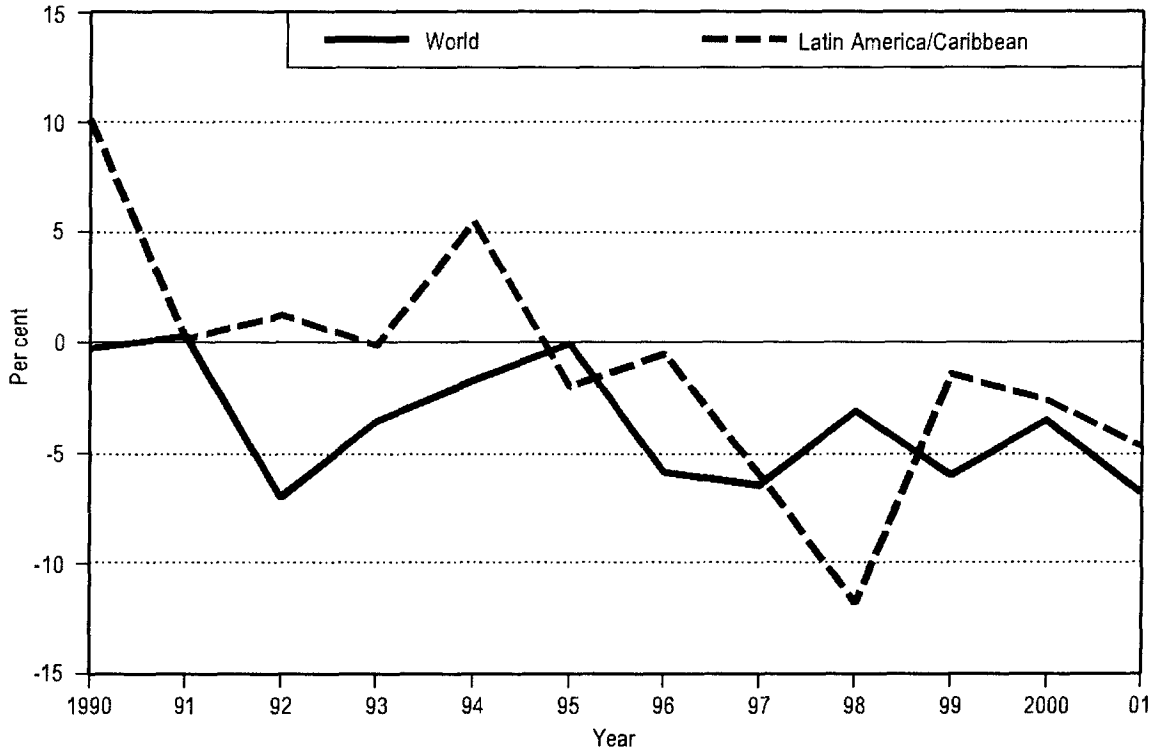
Note.— 2001 figures are from estimated data.

Source: ICAO Air Transport Reporting Form EF-1.

Figure 6-22. Scheduled airline operating revenues and expenses — Latin America and the Caribbean (1990–2001)

serious operating losses, as illustrated in Figure 6-22. A concerted effort of drastic cost-cutting, airline industry restructuring and demand recovery led to a significant turnaround and brought positive operating results for four consecutive years. 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 revenues was incurred by the region's airline industry. The negative trend continued in 2000 with an operating loss of some $100 million (or 0.6 per cent of revenues). Preliminary estimates for 2001 indicate an operating loss of some $200 million (or 1.4 per cent of revenues).

6.59 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 1990 and 2000 while overall yield fell by an average of 1.9 per cent annually but with a significant declining trend in recent years. The year-to-year comparisons of the changes in real passenger yield of the Latin America and Caribbean and world airlines are illustrated in Figure 6-23.



Notes.— 2001 figures are from estimated data.
— Real yield for scheduled airlines measured in U.S. cents per PKP deflated by U.S. Consumer Price Index.

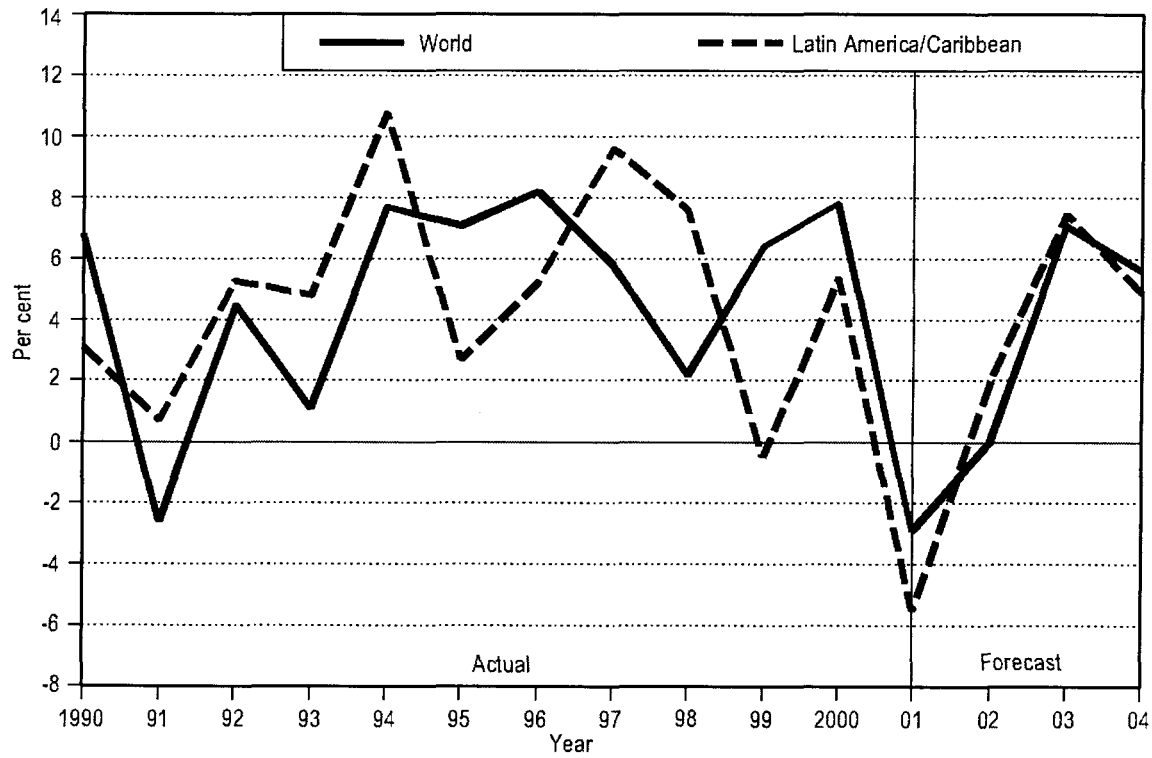
Source: ICAO Air Transport Reporting Forms A and EF-1.

Figure 6-23. Annual change in real scheduled passenger yield — Latin America and the Caribbean and World (1990-2001)

Airline passenger traffic trends and forecast

6.60 Over the 1990–2000 period, the scheduled passenger traffic (in PKPs) of airlines of the Latin America and Caribbean region increased at an average annual rate of 5.0 per cent (compared to the world average growth rate of 4.8 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 5.5 per cent in 2001. 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 the Latin America and Caribbean airlines is shown in Figure 6-24.

6.61 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 Caribbean region is expected to grow by 2.0, 7.5 and 4.9 per cent in 2002, 2003 and 2004, respectively, comparable to the expected growth trend for the world (0, 7.1 and 5.6 per cent).



Source: ICAO.

Figure 6-24. Scheduled passenger traffic growth (PKPs) — Latin America and the Caribbean and World (1990–2004)

APPENDICES

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Appendix 1
Economic Regulation Tables

Table A1-1. Open skies agreements — 1992 to 2001

Year	Parties		Notes
		Agreements involving the United States as a Party	
1992	United States	Netherlands	
1995	United States	Austria	
1995	United States	Belgium	
1995	United States	Denmark	
1995	United States	Finland	
1995	United States	Iceland	
1995	United States	Luxemburg	
1995	United States	Norway	
1995	United States	Sweden	
1995	United States	Switzerland	
1995	United States	Czech Republic	Have a transition annex on services to points in the U.S. and provides for the phasing-in of codesharing points in the U.S. (applicable only to Czech airlines, expired in October 1999)
1996	United States	Germany	7th Freedom rights for all cargo; include intermodal in June 2000
1996	United States	Jordan	
1997	United States	Singapore	7th Freedom rights for scheduled all cargo; suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1997	United States	Brunei	7th Freedom rights for all cargo; suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1997	United States	Panama	7th Freedom rights for all cargo
1997	United States	Taiwan, Province of	
1997	United States	Costa Rica	
1997	United States	El Salvador	7th Freedom rights for all cargo

Year	Parties		Notes
1997	United States	Guatemala	7th Freedom rights for all cargo
1997	United States	Honduras	7th Freedom rights for all cargo
1997	United States	New Zealand	7th Freedom rights for all cargo; suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1997	United States	Nicaragua	7th Freedom rights for all cargo charters
1997	United States	Malaysia	7th Freedom rights for all cargo
1997	United States	Aruba	7th Freedom rights for all cargo
1997	United States	Chile	7th Freedom rights for all cargo; covered by the APEC "Kona"agreement but not yet ratified by Chile
1997	United States	Netherlands Antilles	7th Freedom rights for all cargo
1997	United States	Romania	Have a transition annex that provides for the phasing-in of third-country codesharing (expired in October 2001) and of routes and frequencies (applicable only to Romanian airlines, expired in October 2001)
1998	United States	Uzbekistan	7th Freedom rights for all cargo
1998	United States	Republic of Korea	
1998	United States	Peru	7th Freedom rights for all cargo; have a transition annex that provides for the phasing-in of routes and frequencies of combination services (expires in June 2002) and all cargo services (expired in June 1999) and limits on codesharing (ditto)
1998	United States	Italy	
1999	United States	Pakistan	7th Freedom rights for all cargo
1999	United States	UAE	7th Freedom rights for all cargo; restrictions exist due to multinationality of Gulf Air
1999	United States	Bahrain	7th Freedom rights for all cargo; restrictions exist due to multinationality of Gulf Air
1999	United States	Argentina	7th Freedom rights for all cargo; four-year transition for passenger service; suspended by Argentina in February 2000
1999	United States	Qatar	7th Freedom rights for all cargo; restrictions exist due to multinationality of Gulf Air
1999	United States	Tanzania	7th Freedom rights for all cargo; have a transition annex that applies country-of-origin rule to passenger charter service (expired in October 2001) and limits on ground handling in Tanzania (indefinite)
1999	United States	Dominican Republic	7th Freedom rights for all cargo

Year	Parties		Notes
1999	United States	Portugal	7th Freedom rights for all cargo; include intermodal; have a transition annex that applies country-of-origin rule to charter service (expires in December 2002) and limits on 5th Freedom rights (applicable only to U.S. airlines, expires in December 2003) and 7th Freedom rights for all cargo (expires in December 2003)
2000	United States	Slovak Republic	7th Freedom rights for all cargo; have a transition annex that limits on ground handling (expires in December 2002) and single cargo charter flights (ditto)
2000	United States	Namibia	Have a transition annex that applies country-of-origin rule to charter service (expires in January 2002) and limits on designations (ditto)
2000	United States	Ghana	7th Freedom rights for all cargo; have a transition annex that applies modified Belgian rules to passenger charter service (applicable only to U.S. airlines, expired in March 2006), limits on ground handling in Ghana (ditto), and provides for the phasing-in of 5th Freedom rights and frequencies (ditto)
2000	United States	Burkina Faso	7th Freedom rights for all cargo; restrictions exist due to multinationality of Air Afrique
2000	United States	Turkey	Have a transition annex on intermediate points with traffic rights (expires in March 2003) and on ramp handling (applicable only to U.S. airlines, expires in March 2003), and provides for the phasing-in of third-country codesharing (expires in March 2003) and points in the U.S. (applicable only to Turkish airlines, expires in March 2003)
2000	United States	Gambia	7th Freedom rights for all cargo; have a transition annex on ground handling in Malta (applicable only to U.S. airlines, expires in April 2003)
2000	United States	Nigeria	7th Freedom rights for all cargo; have a transition annex that applies country-of-origin rule to charter service (expires in March 2006) and provides for the phasing-in of frequencies and 5th Freedom rights (applicable only to U.S. airlines, expires in March 2006)
2000	United States	Malta	7th Freedom rights for all cargo; have a transition annex on ground handling in Malta (expires in September 2004), 7th freedom rights for all cargo (ditto) and 5th freedom rights (applicable only to U.S. airlines, expires in September 2004)
2000	United States	Morocco	7th Freedom rights for all cargo; include intermodal; have a transition annex on intermodal cargo services (applicable only to U.S. airlines, expires in March 2003), 5th Freedom rights (applicable only to U.S. airlines, expires in October 2005) and 7th Freedom rights for all cargo (expires in October 2005)

Year	Parties		Notes
2000	United States	Rwanda	7th Freedom rights for all cargo; have a transition annex on ground handling (applicable only to U.S. airlines, expired in March 2001)
2000	United States	Benin	7th Freedom rights for all cargo
2000	United States	Senegal	7th Freedom rights for all cargo; have a transition annex on ground handling (applicable only to U.S. airlines, expires in March 2003) and provides for the phasing-in of U.S. third-country codesharing (ditto)
2001	United States	Poland	7th Freedom rights for all cargo; have a transition annex on service to points in the other country, intermediate and beyond points (expires in December 2003) and on ground handling at airports in Poland other than Warsaw (expires in December 2002)
2001	United States	Oman	7th Freedom rights for all cargo; restrictions exist due to multinationality of Gulf Air; have a transition annex on combination flights between Muscat and Dubai, and Muscat and points in India (applicable only to U.S. airlines, until 3 years after signature of this agreement)
2001	United States	France	7th Freedom rights for all cargo; include intermodal in October 2000
2001	United States	Sri Lanka	Have a transition annex on pricing (expires in December 2004), passenger charter (expires in December 2006), ground handling in Sri Lanka (applicable only to U.S. airlines, expires in March 2008) and local traffic right between India and Sri Lanka (applicable only to U.S. airlines, expires in December 2006)
		Agreements not involving the United States as a Party	
1996	Brazil	Chile	
1996	Brazil	New Zealand	
1996	Panama	Venezuela	
1997	Brunei	Singapore	Suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1997	Guatemala	Panama	
1997	Kenya	Netherlands	
1997	New Zealand	Singapore	7th Freedom rights for all cargo service; suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1997	Panama	Peru	
1998	Chile	New Zealand	The exercise of traffic rights from third countries is subject to the approval of the aeronautical authorities of the two countries; covered by the APEC "Kona"agreement but not yet ratified by Chile

Year	Parties		Notes
1998	Chile	Panama	
1998	Denmark	New Zealand	
1998	Ethiopia	UAE	
1998	Malaysia	New Zealand	
1998	New Zealand	Norway	
1998	New Zealand	Sweden	
1998	Pakistan	UAE	
1998	Turkmenistan	UAE	
1998	UAE	Uganda	
1999	Brunei	New Zealand	Includes provision to permit 7th/8th Freedom rights; suspended in December 2001 upon entry into force of the APEC "Kona" agreement
1999	Chile	Costa Rica	
1999	Ireland	New Zealand	
1999	New Zealand	Switzerland	Excludes 5th Freedom rights in Singapore, Bangkok and Hong Kong
2000	Australia	New Zealand	Single Aviation Market agreement in November 1996 (have a ceiling for 5th Freedom rights), 5th Freedom limitation was lifted in 2000; 7th Freedom rights for all cargo
2000	Cook Islands	New Zealand	
2000	New Zealand	Samoa	Two-year transition for passenger service
2000	South Africa	Zimbabwe	
2001	Cook Islands	Samoa	
2001	Samoa	Tonga	

Table A1-2. Major anti-competitive cases reported in 2001

Australia	The Australian Competition and Consumer Commission received a complaint from Virgin Blue alleging that Qantas had increased its capacity on the Brisbane-Adelaide route by 50 per cent after Virgin Blue had announced a 90 per cent capacity increase in September 2000 (January).
Canada	The Competition Bureau asked the Competition Tribunal for an order prohibiting Air Canada from engaging in anti-competitive practices directed against low-cost carriers WestJet and CanJet (March).
Germany	The European Commission fined Deutsche Post Euro 24 million for offering loyalty rebates to mail-order customers that kept competitors from entering markets. In a separate action, Deutsche Post agreed to set up a new company to handle business parcel operations to avoid cross-subsidization from the monopoly mail operations (March).
Italy	The Italian competition authorities fined Alitalia Euro 27 million for abuse of dominant position, penalizing Alitalia for the travel agents' loyalty bonus scheme it launched in 1997 (July).
Korea	The Korean Fair Trade Commission fined Asiana Airlines and Korean Air a total of Korean Won 3.03 billion for conspiring to set domestic air fares for group travellers (July).
Sweden, Denmark	The European Commission fined SAS and Maersk Air a total of Euro 52.5 million for colluding in running a monopoly on the Stockholm-Copenhagen route. The Commission officials raided both companies' head office in June 2000 (July).
United States	The Court of Appeals for the Second Circuit agreed with a lower court judge in 1999 that Virgin Atlantic Airways submitted insufficient proof that British Airways used monopoly power over five U.S.-Heathrow routes to get travel agents and corporate customers to sign anti-competitive sales agreement. Virgin filed the suit in 1993 (July).
Venezuela	Venezuela's antitrust regulators cleared Aeropostal of charges of predatory practices in the sale of passenger tickets on domestic routes brought against the carrier by Aserca. According to the regulator, sales increases deemed unfair by Aserca were in fact the result of improved marketing by Aeropostal (October).

Table A1-3. Airlines' commercial agreements concluded and amended in 2001

Adria Airways - Austrian Airlines (C, N)
Aer Lingus - Iberia (C)
Aer Lingus - KLM (C)
Aer Lingus - Sabena (C, T)
Aeroflot - Austrian Airlines (C, N)
Aeroflot - Estonian Air (C, N)
Aeroflot - Sibir (C, N)
Aerolitoral - AeroMexico (C)
Aerolitoral - Delta Air Lines (C, N)
AeroMexico - Air France (C)
AeroMexico - CSA Czech Airlines (C)
AeroMexico - Delta Air Lines (C)
AeroMexico - TACA (C, N)
Aeroperlas Commuter - TACA (C, N)
Aeropostal - Air Europa (C, N)
Aeropostal - Lufthansa (C, N)
Air Afrique - Swissair (C, T)
Air Algeire - Alitalia (C, N)
Air Alps Aviation - Swissair (C, T)
Air Botswana - Kenya Airways (C, N)
Air Caledonie - Air France (C, N)
Air Canada - Alitalia (C, T)
Air Canada - All Nippon Airways (C)
Air Canada - Austrian Airlines (C)
Air Canada - Lufthansa (C)
Air Canada - Mexicana (C)
Air Canada - Thai Airways (C)
Air Canada Regional - Air Labrador (C, N)
Air China - Northwest Airlines (C)
Air China - Shanghai Airlines (C)
Air Dolomiti - Lufthansa (C)
Air Engiadina - KLM (F, T)
Air Europa - Continental Airlines (C, N)
Air Europa - Swissair (C, T)
Air Europa - TransWorld Airlines (C, T)
Air Foyle - Heavy-Lift (CG, N)
Air France - Alitalia (C, N)
Air France - Air Lib (C, N)
Air France - British European Airways (C, F)
Air France - Delta Air Lines - Korean Air (CG)
Air France - Delta Air Lines (C)
Air France - Finnair (C, N)
Air France - Gandalf Airlines (C)
Air France - Japan Airlines (C)
Air France - Portugalia (C, N)
Air France - TACA (C)
Air France - Winair (C, N)
Air India - Kuwait Airways (C)
Air India - Lufthansa (C, N)
Air India - Malaysia Airlines (C)
Air India - SAS (C)
Air India - Silk Air (C, N)
Air India - Thai Airways (C, N)
Air Jamaica - Delta Air Lines (C)
Air Jamaica - LIAT (M, N)
Air Kazakhstan - East Line Airlines (C, N)
Air Kazakhstan - Uzbekistan Airways (C, N)
Air Littoral - Swissair (C, T)
Air Malta - Olympic Airways (C, N)
Air Mauritius - Cathay Pacific (C, N)
Air Mauritius - Swissair (C, N, T)
Air New Zealand - Lufthansa (C)
Air New Zealand - Royal Tongan Airlines (C, N)
Air New Zealand - Singapore Airlines (C)
Air New Zealand - Thai Airways (C)
Air Tahiti Nui - Qantas (C)
Air Tanzania - Ethiopia Airlines (M, N)
Air Tanzania - Kenya Airways (C, N)
Air Wisconsin - United Airlines (F)
Air Zimbabwe - Zambia Skyways (M, N)
Airzena Georgian Airlines - Swissair (C, T)
Alaska Airlines - Hawaiian Airlines (C, N)
Alaska Airlines - Rootsair (M, N, T)
Alitalia - Braathens (C)
Alitalia - Delta Air Lines (C, N)
Alitalia - Northwest Airlines (C, T)
Alitalia - Qantas (C, N)
Alitalia - Varig (C, N)
All Nippon Airways - Ansett (C, T)
All Nippon Airways - BMI British Midland (C)
All Nippon Airways - United Airlines (C)
All Nippon Airways - Vietnam Airlines (C, N)
America West Airlines - Big Sky Airlines (C, N)
America West Airlines - Chautauqua Airlines (F, N)
America West Airlines - Mesa Airlines (C, F)
American Airlines - Asiana (C, T)
American Airlines - Canada 3000 (M, N, T)
American Airlines - China Eastern Airlines (C)
American Airlines - EVA Airways (C)
American Airlines - Gol (C, N)
American Airlines - Iberia (C)
American Airlines - Qantas (C)
American Airlines - Sabena (C, T)
American Airlines - Swissair (C, T)
American Airlines - TACA (C)
American Airlines - TAM (C)
American Airlines - TransWorld Airlines (C, N)
American Airlines - Vietnam Airlines (C, N)
American Airlines (TransWorld Airlines) - Chautauqua Airlines (F)
American Airlines (TransWorld Airlines) - Trans States Airlines (F)
American Eagle - Sabena (C, T)
American Eagle - Swissair (C, T)
Ansett - Air New Zealand (C, T)
Ansett - KLM (C, T)
Ansett - Lauda Air (C, T)
Ansett - Singapore Airlines (C, T)
Ansett - Thai Airways (C, T)
Ansett - United Airlines (C, T)
AOM-Air Liberté - Sabena (C, T)
Aserca - Varig (C, N)
Asiana - Cathay Pacific (M, N)
Asiana - Korean Air (C, N)
Asiana - Sabena (CG, T)
Atlantic Coast Airlines - BMI British Midland (C, N)

Atlantic Southeast Airlines - Delta Air Lines - South African Airways (C, N)
Augusburg Airways - Lufthansa (F, N)
Aurigny Air Services - BMI British Midland (C, N)
Austrian Airlines - Croatia Airlines - Tyrolean Airways (C, N)
Austrian Airlines - SAS - Tyrolean Airways (C)
Austrian Airlines - Spanair (C, N)
Avioimpex - Croatia Airlines (C, N)
Balair CTA - Swissair (C, T)
Binter Mediterraneo - Iberia (F, N)
BMI British Midland - Lufthansa - SNCF (I)
BMI British Midland - Mexicana (C)
BMI British Midland - United Airlines (C)
Bouraq Airlines - Dirgantara Air Service - Mandala Airlines - Pelita Air Service (M, N)
Braathens - KLM (C, T)
Brit Air - Delta Air Lines (C, N)
British Airways - Cathay Pacific (C)
British Airways - Iberia (C)
British Airways - Maersk Air (F)
British Airways - Nigeria Airways (C, T)
British Airways - Qantas (C)
British Airways - Regional Air (F, N)
British European Airways - Delta Air Lines (C, N)
British European Airways - ScotAirways (C, N)
Cargolux - Swissair (CG, T)
Caribbean Star - Helen Air (C, N)
Cathay Pacific - China Eastern Airlines (M, N)
Cathay Pacific - Philippine Airlines (C, N)
Cebu Pacific Airlines - Northwest Airlines (M, N)
China Airlines - Delta Air Lines (C, N)
China Airlines - Transaero (C, N)
China Airlines - Vietnam Airlines (C)
China Eastern Airlines - China Northwest Airlines (M, N)
China Eastern Airlines - Yunnan Airlines (M, N)
China Northern Airlines - China Southern Airlines (C, N)
China Postal Airlines - China Southern Airlines (CG, N)
China Postal Airlines - Shandong Airlines - Shanghai Airlines - Shenzhen Airlines - Sichuan Airlines - Wuhan Airlines (C, N)
China Southern Airlines - Delta Air Lines (C)
China Southern Airlines - Garuda (C, N)
China Southern Airlines - Japan Air System (C)
China Southern Airlines - KLM (C, N)
China Southern Airlines - Yunnan Airlines (C, N)
Comair - CSA Czech Airlines (C, N)
Comair - Delta Air Lines - South African Airways (C, N)
Continental Airlines - KLM (C, N)
Continental Airlines - Midway Airlines (M, N)
Continental Airlines - TANS (C, N)
Continental Airlines - Transbrasil (C, N, T)
Croatia Airlines - LOT Polish Airlines (C, N)
Croatia Airlines - Sabena (C, N, T)
Croatia Airlines - Swissair (C, N, T)
Crossair - Finnair (C)
Crossair - LOT Polish Airlines (C)
Crossair - Sabena (C, T)
Crossair - Tunis Air (C, N)
CSA Czech Airlines - Delta Air Lines (C)
CSA Czech Airlines - Swissair (C, T)
Cubana - Spanair (C, N)
Cyprus Airways - Syrianair (C, N)
Delta Air Lines - El Al (C)
Delta Air Lines - Emirates (C, N)
Delta Air Lines - LAPA (C, N)
Delta Air Lines - SNCF (I, N)
Delta Air Lines - South African Airways (C)
Delta Air Transport - Swissair (C, T)
DHL - Northwest Airlines (CG, N)
Doragon Air - Japan Airlines (M, N)
El Al - Sabena (C, T)
Eurowings - Lufthansa (C)
Eurowings - VLM (C, N)
Finnair - Golden Air (C, N)
Finnair - Sabena (C, T)
Finnair - Swissair (C, T)
Flightline - Swissair (C, T)
Four Star Aviation - Swissair (C, T)
Frontier - Great Lakes Aviation (C, N)
Frontier - Mesa Airlines (F, N)
Gandalf Airlines - Airzena Georgian Airlines (M, N)
Garuda - Malaysia Airlines (CG)
Garuda - Philippine Airlines (C, N)
Gemini Air Caego - Swissair (C, T)
Great Lakes Aviation - United Airlines (F, T, C)
Gulf Air - Kuwait Airways (M)
Gulf Air - Oman Air (C, N)
Heavy-Lift - Volga-Dnepr (CG, T)
Iberia - Lan Chile (C)
Iberia - Lithuanian Airlines (C, N)
Iberia - Swissair (C, T)
Iberia - TAM (C)
Impulse - Qantas (F, N)
Iran Air - Swissair (C, T)
Japan Airlines - Swissair (C, T)
Kenya Airways - Air Malawi (C, N)
KLM - Maersk Air (C)
KLM - Malaysia Airlines (C)
KLM - Malev (C)
KLM - Northwest Airlines (C)
KLM - TNT Express (CG, N)
LAB - TACA (C, N)
LOT Polish Airlines - Sabena (C, T)
LOT Polish Airlines - Swissair (C, T)
LTU - Swissair (C, T)
Lufthansa - Singapore Airlines (C)
Lufthansa - Thai Airways (C)
Lufthansa - United Airlines (C)
Maersk Air - Sabena (C, T)
Malaysia Airlines - Qatar Airways (C, N)
Malaysia Airlines - Swissair (CG, C, T)
Malev - Northwest Airlines (C, N)
Malev - Swissair (C, T)
Mexicana - SAS (C)
Mexicana - United Airlines (C)
Midway Airlines - Northwest Airlines (M, N)
Midwest Express - Virgin Atlantic Airways (C, N)
Nationwide Air - Sabena (C, T)
Northwest Airlines - Transavia (C, N)
Oman Air - SriLankan Airlines (C, N)
Philippine Airlines - Vietnam Airlines (C, N)

Polynesian Airlines - Qantas (C)
Qantas - Swissair (C, T)
Sabena - Schreiner Airways (C, T)
Sabena - Sobelair (C, T)
Sabena - Swissair (C, T)
Sabena - TAP Air Portugal (C, T)
Sabena - Ukraine International Airlines (C, T)
Sabena - Virgin Express (C, M, T)
Sabena - VLM (C, T)
Shuttle America - US Airways (F, N)
Singapore Airlines - Virgin Atlantic Airways (C)
SkyWest Airlines - United Airlines (F)
South African Airways - Swissair (C, T)
Spanair - Varig (C, N)
SriLankan Airlines - Swissair (C)
Swissair - TAP Air Portugal (C, T)
Swissair - Tunis Air (C, T)
Swissair - Turkish Airlines (C, T)
TAP Air Portugal - LAM (C)
Thai Airways - United Airlines (C)
Thai Airways - Vietnam Airlines (C, N)
Transbrasil - Varig (C)
UPS - Vietnam Airlines (CG, N)

C denotes codesharing, blockspace or operational agreements;
CG denotes cargo agreements;
F denotes franchise agreements;
I denotes intermodal agreements;
M denotes agreements not involving codesharing or blockspace
N denotes new partnership formed in 2001;
T denotes agreements were terminated in 2001

Table A1-4. Global alliances

Alliance	Founded	Members
Star Alliance	May 1997	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).
Oneworld	September 1998	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	AeroMexico, Air France, Delta Air Lines and Korean Air; subsequently joined by CSA Czech Airlines (April 2001) and Alitalia (July 2001).
Wings	—	KLM and Northwest Airlines since 1989; subsequently joined by Continental Airlines and Alitalia in 1999, but Alitalia and KLM ended their partnership in April 2000; Kenya Airways, Malaysia Airlines and Malev are regarded as member airlines.
Qualiflyer	March 1998	AOM, Austrian Airlines Group (withdrawn in September 1999), Crossair, Sabena, Swissair, TAP Air Portugal, Turkish Airlines; subsequently joined by Air Littoral (July 1998), Air Europe (May 1999), LOT Polish Airlines (January 2000), Portugalia (January 2000), Volare Airlines (January 2000), and Air Liberté (May 2000).

Appendix 2
Statistical Tables

Table A2-1. Regional distribution of scheduled traffic — 2001

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	6 850	6 330	429 290	787 410	70	32 590	108 320	169 890	64
Percentage of world traffic	27.0	29.4	26.5	26.9		29.4	28.1	26.0	
Africa	600	500	31 280	67 260	63	2 050	8 230	16 120	51
Percentage of world traffic	2.4	2.3	1.9	2.3		1.9	2.1	2.5	
Middle East	650	430	45 510	96 840	68	4 580	13 580	22 780	60
Percentage of world traffic	2.6	2.0	2.8	3.3		4.1	3.5	3.5	
Asia and Pacific	4 780	3 590	376 360	736 040	68	37 730	105 770	172 790	61
Percentage of world traffic	18.9	16.7	23.2	25.1		34.1	27.4	26.4	
North America	10 840	8 810	641 780	1 108 780	70	29 600	133 040	242 080	55
Percentage of world traffic	42.8	41.0	39.6	37.8		26.7	34.5	37.0	
Latin America and Caribbean	1 610	1 840	97 010	134 040	62	4 130	16 430	30 950	53
Percentage of world traffic	6.4	8.6	6.0	4.6		3.7	4.3	4.7	
Total	**25 330**	**21 500**	**1 621 230**	**2 930 370**	**69**	**110 680**	**385 370**	**654 610**	**59**
International services of airlines of ICAO Contracting States									
Europe	5 320	3 570	262 180	659 130	71	31 790	95 680	148 580	64
Percentage of world traffic	44.0	58.2	49.3	38.4		33.5	37.0	35.5	
Africa	460	220	18 240	58 300	64	1 970	7 330	14 380	51
Percentage of world traffic	3.8	3.6	3.4	3.4		2.1	2.8	3.4	
Middle East	540	250	27 610	84 140	67	4 490	12 340	20 530	60
Percentage of world traffic	4.5	4.1	5.2	4.9		4.7	4.8	4.9	
Asia and Pacific	2 630	770	120 370	505 280	70	34 250	82 620	128 420	64
Percentage of world traffic	21.8	12.6	22.6	29.4		36.1	32.0	30.7	
North America	2 380	870	75 950	331 030	72	18 970	49 750	87 490	57
Percentage of world traffic	19.7	14.2	14.3	19.3		20.0	19.2	20.9	
Latin America and Caribbean	760	450	27 990	78 680	66	3 400	10 830	19 060	57
Percentage of world traffic	6.3	7.3	5.3	4.6		3.6	4.2	4.6	
Total	**12 090**	**6 130**	**532 340**	**1 716 560**	**70**	**94 870**	**258 550**	**418 460**	**62**

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 2001[1] (excludes military and government operated aircraft)

Type of Aircraft	Before 2001	Delivered during 2001	Total as of 31/12/01	Ordered during 2001[2]	Remaining to be delivered as of 31/12/01[3]
Turbojets					
Airbus Industrie A-300	494	13	507	61	75
Airbus Industrie A-310	252	0	252	0	5
Airbus Industrie A-318	0	0	0	0	114
Airbus Industrie A-319	310	90	400	44	275
Airbus Industrie A-320	890	120	1010	101	492
Airbus Industrie A-321	172	49	221	27	183
Airbus Industrie A-330	174	38	212	52	194
Airbus Industrie A-340	182	21	203	2	84
Airbus Industrie A-380/380F	0	0	0	85	85
Boeing 717	44	49	93	6	60
Boeing 737	3 788	298	4 086	124	752
Boeing 747	1 246	31	1 277	16	56
Boeing 757	942	45	987	44	54
Boeing 767	815	40	855	45	72
Boeing 777	316	61	377	30	196
British Aerospace - 146/RJ 85/100	354	11	365	14	0
Canadair Regional Jet	434	152	586	230	562
Dornier DO-328/728/928 Jet	39	33	72	46	24
Embraer EMB - 145/135/140/170/195	282	166	448	62	516
McDonnell-Douglas MD-80/90	1 305	0	1 305	0	0
McDonnell-Douglas MD-11	*192*	*2*	*194*	0	0
Total of aircraft in production	12 231	1 219	13 450	989	3 799
Total of aircraft not in production[4]	6 286				
Total turbojets	18 517	1 219	13 450	989	3 799
Turboprops					
Aerospatiale/Aeritalia ATR-42/72	608	21	629	27	21
DeHavilland Canada DHC-8	572	52	624	16	43
Dornier DO-228/328	138	3	141	2	8
SWEARINGEN Metro 23	103	6	109	6	0
Embraer EMB-120 Brasilia	350	2	352	0	0
Beechcraft 1900 D	191	16	207	18	0
CASA212/CASA-IPTN CN-235/295	521	9	530	20	49
Total of aircraft in production	2 483	109	2 592	89	121
Total of aircraft not in production[4]	3 430		3 430		
Total turboprops	5 913	109	6 022	89	121

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, 1982-2001

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.								
1982	25	762	0.08	0.13	0.28	0.46	0.18	0.25
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
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	0.199	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

na not available

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

Table A2-4. Aviation security (1982-2001)

Year	Number of acts of unlawful interference	Number of acts of unlawful seizure: Attempted seizures	Number of acts of unlawful seizure: Actual seizures	Number of acts of sabotage	Other acts[1]	Number of persons injured or killed during acts of unlawful interference: Injured	Number of persons injured or killed during acts of unlawful interference: Killed
1982	36	11	19	6	-	119	14
1983	45	17	21	7	-	70	15
1984	41	7	21	13	-	249	68
1985	40	7	20	13	-	243	473
1986	14	6	5	3	-	235	112
1987	13	6	4	3	-	121	166
1988	12	3	7	2	-	21	300
1989	14	4	8	2	-	38	278
1990	36	12	20	1	3	145	137
1991	15	5	7	0	3	2	0
1992	10	2	6	0	2	123	10
1993	30	4	21	0	5	2	28
1994	37	5	20	2	10	53	36
1995	14	2	9	0	3	3	0
1996	15	2	10	0	3	54	130
1997	6	1	4	0	1	0	1
1998	9	1	6	0	2	1	0
1999	6	0	6	0	0	2	2
2000	11	1	8	0	2	20	0
2001	21	2	7	1	11	3 205[2]	3 520[2]

1. Includes missile and facility attacks.
2. 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.

Appendix 3
Methodology for Traffic Forecasts

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

2. As a basis for the development of traffic forecasts, econometric analyses were carried out, which established a relationship between passenger traffic demand, GDP, GDP/capita and airline yields. The airline yields have been expressed in SDR (Special Drawing Rate) due to the strengthening of the U.S. dollar against most of the currencies. Several econometric models were developed at global and regional levels. While at a global level these models appear to provide reasonably robust results, they have been less adequate at the regional level.

3. Based on forecasts of economic developments and expectations of yield, traffic forecasts for the years 2002, 2003 and 2004 were estimated using the econometric models. The forecast traffic growth rates were then reviewed in the light of recent trends in the airline operating environment and prospective changes in other factors which could not be accommodated in the econometric analyses.

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

where:

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

y = passenger-kilometres performed (PKP)

x_1 = gross domestic product in real terms (GDP)

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

5. Values of the constant coefficients a, b_1 and b_2 were obtained by statistical estimation procedures using econometric analysis where b_1 and b_2 are equal to the elasticities of demand with respect to corresponding x_1 (GDP) and x_2 (PYIELD), i.e. elasticities of income and price. A "dummy" variable has been introduced to capture the impact of recent changes in the world economy and traffic trends.

6. Using logarithmics, the above relationship was transformed into the equivalent linear relationship $ln\ y = a + b_1 lnx_1 + b_2 lnx_2$. Annual data covering a period of 22 years were used in the subsequent econometric (least squares regression) analysis, with the following results at the global level.

ln PKP	=	−2.995 + 1.87 *ln* GDP	−0.48 *ln* PYIELD	−0.09 (dummy)	$R^2 = 0.991$
		(6.8)	(−2.9)	(−2.8)	S.E. = 0.04

R = coefficient of correlation
S.E. = standard error of the estimate
( ) = "t" values of the corresponding coefficient estimates

— END —

ICAO PUBLICATIONS
IN THE AIR TRANSPORT FIELD

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

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

Council Statements on policy relating to air transport questions, such as charges for airports and air navigation services, taxation and aims in the field of facilitation;

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

Circulars providing specialized information of interest to Contracting States. They include 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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