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1986

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FOREWORD

Terms of Reference

1. This review is the eighth in a triennial series beginning with ICAO Circular 73-AT/10 published in 1965 and followed by Circular 89-AT/15 (1968), Circular 105-AT/26 (1971), Circular 122-AT/32 (1974), Circular 133-AT/40 (1977), Circular 158-AT/57 (1980) and Circular 177-AT/67 (1983). After examination of the second review, the Sixteenth Session of the Assembly expressed the view that similar documents should be produced for each major Session as background material for the work of the Economic Commission.

Coverage

2. The coverage of this review extends to the whole of the Organization's membership of 156 Contracting States as of 31 December 1985 for the period from 1975 to 1985, data for new Member States having been included retroactively where possible. Data for 1985 has been estimated on the basis of partial reporting for that year. Coverage extends to all activities of the scheduled airlines of Contracting States reported to ICAO for the years 1975 to 1985 and published in the statistical Series on aircraft on register, airline fleet and personnel, airline traffic, and airline financial data. The activities of the non-scheduled operators are covered less fully since data for these carriers, although supplemented from other sources, are somewhat incomplete.

Sources of Information

3. In addition to the ICAO Digests of Statistics use has been made of many of the Organization's economic studies, such as the earlier editions of this review, and the series of regional studies dealing with the development of international air freight and air passenger transport. Use has also been made of the Annual Reports of the Council to the Assembly for the years 1975 to 1985.

4. Sources of information other than ICAO, referred to in the text, include the appropriate and most recently available statistical publications of the United Nations; the United Nations Conference on Trade and Development (UNCTAD); the European Civil Aviation Conference (ECAC); the Organization for Economic Cooperation and Development (OECD); the International Air Transport Association (IATA); the Association of European Airlines (AEA); the United States Civil Aeronautics Board (CAB) and the Department of Transportation (DOT); the World Tourism Organization (WTO); the International Monetary Fund (IMF); and the World Bank.

Status

5. This Circular has been approved and is published by authority of the Secretary General.

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Chapter 1 - SUMMARY OF AIR TRANSPORT DEVELOPMENT: 1975-1985

1. In this summary chapter, attention is focussed on the more significant aspects of the air transport trends and developments from 1975 to 1985 that are reviewed and analysed in detail in the subsequent chapters. Air transport development is then related to some general economic indicators.

Operators and their Fleets

2. The numbers of civil transport aircraft of more than 9 000 kilogrammes maximum take-off weight increased from 8 113 in 1975 to 9 400 in 1985¹ and the composition of this fleet underwent significant changes. Jet aircraft increased, as a proportion of the total, from 63 to 75 per cent and accounted at the end of the period for almost 100 per cent of the capacity offered on international services. Parallel with this, piston-engine aircraft decreased from 18 to 8 per cent and turbo-prop types from 19 to 17 per cent. Wide-body jets totalled 1 572 at the end of 1985, up from 592 in 1975. By the end of the decade the most numerous category in service was the two-engine narrow-bodied jet, accounting for almost 3 000 aircraft. In 1985, 45 per cent of the total fleet was registered in North America and 23 per cent in Europe compared with 40 per cent and 26 per cent in 1975.

3. This fleet of 9 400 aircraft was operated in 1985 by approximately 900 carriers of which 396 were domestic (225 scheduled and 171 non-scheduled) and 478 were international (251 scheduled and 227 non-scheduled). Scheduled airlines operated 87 per cent of the aircraft and 91 per cent of the jets, the remainder being operated by charter carriers. Over the period the total number of carriers grew by about 40 per cent, among them domestic by more than 70 per cent, international by 16 per cent, scheduled by about 20 per cent and non-scheduled by about 60 per cent. Regarding personnel, the total number employed by the international scheduled airlines increased from 885 000 in 1975 by 12 per cent to 992 000 in 1985. Of these totals, flight crew (excluding cabin attendants) numbered 87 500 in 1975 and 106 500 in 1985, an increase of 22 per cent.

1/ Excluding the USSR and China for which data are not available.

Traffic

4. The total volume of traffic in 1985 amounted to approximately 181 800 million tonne-kilometres performed of which 166 600 million or 92 per cent was scheduled and 8 per cent non-scheduled. Of the scheduled total, international traffic amounted to an estimated 85 540 million tonne-kilometres of which passengers account for a 64 per cent proportion, freight 34 per cent and mail 2 per cent. Domestic traffic accounted for 81 030 million tonne-kilometres of which 79 per cent was performed in the United States and the USSR. Over the ten-year period from 1975 to 1985 the share of the international scheduled traffic carried by European airlines decreased from 43.5 per cent to 37.5 per cent and that of North American airlines from 22.1 per cent to 19.9 per cent while the airlines of the Asia and Pacific region increased their share from 18.7 per cent to 26.7 per cent. As a reflection of these shifts the proportion of the world's international traffic carried over the North Atlantic remained the same and on Intra-European routes declined. Weight load factors for international traffic as a whole rose from a low of 52 per cent in 1975 to a plateau in the 58 to 59 per cent range between 1978 and 1982, and to 61 per cent in 1985, the highest being recorded by carriers of Asia and the Pacific (66%), the lowest by those of Africa (50%). The average ratio of peak month to trough month of the volumes of international scheduled traffic was 1.75 for passenger and 1.35 for freight traffic.

5. Non-scheduled services were operated in 1985 generally over shorter stage distances than scheduled services and were predominantly international (89%) and passenger-oriented (78%). It is estimated that in 1985 the total volume of non-scheduled international passenger traffic amounted to about 118 100 million passenger-kilometres of which 58 per cent was carried by specialized charter operators and 42 per cent by scheduled airlines on their non-scheduled services. This volume represented 16.6 per cent of all international passenger traffic, down from about 26 per cent in 1975.

6. The average annual growth rate from 1975 to 1985 was 7.0 per cent for scheduled traffic as a whole but was only 2.2 per cent for non-scheduled operations. The ten-year average annual growth rate for international scheduled traffic was 8.6 per cent and varied considerably from one region to another. For Asia and the Pacific carriers it was 12.6 per cent while for those of Europe and Latin America it was 7.0 per cent. The average rate was slightly higher for freight traffic (9.5%) than for passenger traffic (8.2%).

Financial Trends

7. Over the decade the average annual growth rate for the total operating revenues of scheduled airlines was slightly higher than that for their operating expenses (11.3% and 11.1% respectively). During the period the operating results for total services fluctuated between 5.3 and -0.7 per cent of revenues and between 5.2 and -2.4 per cent for international services. Net

results fluctuated between 4.1 and -1.4 per cent for total services and 2.1 and -3.4 per cent for international. It must of course be borne in mind that all of the figures cited are averages masking a variety of situations for individual airlines some of which are in a much better financial position than others.

8. During the decade the average unit revenue (expressed in cents per tonne-kilometre performed) or the average cost to the user increased at average rates of 3.9 per cent per annum for total services and 3.1 for international alone. Unit cost and revenues increased moderately until 1980 when drastic fuel price increases led to an increase in unit costs of about 20 per cent; after reaching in 1981 their peak value these parameters slowly decreased until 1985 when the upward trend resumed. Among the individual items of operating cost, general, administrative and other and aircraft fuel and oil were the fastest growing, while flight operations less fuel and oil, maintenance and overhaul, and landing and associated airport charges showed the slowest increase. The share of the fuel and oil cost in operating expenses reached its maximum value of 29.2 per cent in 1981 and then decreased to 23.1 in 1985.

Productivity

9. The various measures of airline productivity generally showed improvement between 1975 and 1985. The average payload capacity of aircraft operated by scheduled international airlines increased by 32 per cent over the period and the volume of traffic performed per aircraft increased by some 93 per cent. The number of tonne-kilometres performed per employee increased by 104 per cent.

Air Transport Related to General Economic Indicators

10. Various aspects of the development of air transport are compared with the changes of the related general economic indicators in Table 1.1. The first half of the period saw rather healthy economic development whereas the second was marked by reduced rates of growth in most areas of economic activity, largely due to the severe worldwide recession in 1980-1982. Although air transport was strongly affected by the escalation of fuel prices, especially in 1979-1980 and the economic recession, the industry continued to perform well compared with many other sectors of the economy.

Table 1.1

WORLD AIR TRANSPORT DEVELOPMENT^{1/} AND RELATED ECONOMIC INDICATORS^{2/}
(Data in millions except when otherwise indicated)

Description	1975	1980	1985	Average Annual Increase (%)		
				1975-80	1980-85	1975-85
Total Scheduled Air Traffic						
Tonne-kilometres performed	72 000	114 400	147 900	9.7	5.3	7.5
Total operating revenue \$	38 309	87 676	112 000	18.1	6.3	12.7
World GDP, excluding services (index) ^{4/}	53	100	105 ^{5/}	13.5	1.2 ^{5/}	7.9 ^{5/}
World production of el. energy kWh ^{3/}	6 527 000	8 247 000	8 979 000 ^{5/}	4.7	2.1 ^{5/}	3.6 ^{5/}
Air Passenger Traffic						
Passenger-kilometres	581 000	937 000	1 185 000	10.0	4.8	7.4
Passenger revenue \$	30 174	69 930	87 500	18.3	4.6	11.2
Gross domestic product, developed market economies \$ ^{4/}	4 109 959	7 654 676	8 232 230 ^{5/}	13.2	1.5 ^{5/}	8.0 ^{5/}
International tourist arrivals ^{3/}	215	280	325	5.4	3.0	4.2
International tourist receipts \$ ^{2/}	41 100	95 300	105 000	18.3	2.0	9.8
Air Freight Traffic						
Freight tonne-kilometres	17 370	26 820	36 850	9.1	6.6	7.8
Freight revenue \$	4 196	9 468	12 500	17.7	5.7	11.5
World production, manufactured goods (index) ^{4/}	80.1	100.0	108.5 ^{5/}	4.5	2.1 ^{5/}	3.4 ^{5/}
World export, manufactured goods (\$'000) ^{4/}	470	1 047	1 072 ^{5/}	17.4	0.6 ^{5/}	9.6 ^{5/}
Air Passenger Average Unit Price						
Passenger yield, cents per pass.-km	5.2	7.5	7.4	7.6	-0.3	3.6
Gross domestic product, developed market economies, per capita \$ ^{4/}	5 548	9 937	10 401 ^{5/}	12.4	1.1 ^{5/}	7.2 ^{5/}
Air Freight Average Unit Price						
Freight yield, cents per tonne-km.	24.2	35.3	33.9	7.8	-0.8	3.4
Unit price index, world export manufactured goods for developed market economies ^{4/}	63	100	86 ^{5/}	9.7	-3.0 ^{5/}	3.5 ^{5/}
Labour Productivity						
Air transport tonne-km. performed per employee (index)	65	100	132	9.0	5.7	7.3
Manufacturing, developed market economies (index) ^{4/}	83	100	107 ^{6/}	3.8	2.3 ^{6/}	3.2 ^{6/}

- Notes: 1. Excluding domestic operations within the USSR; 1985 data are preliminary estimates.
2. Index: 1980 = 100
3. World Tourism Organization, "World Tourism Statistics" (Various).
4. United Nations, "Yearbook of Statistics" and "Monthly Bulletin of Statistics" (Various).
5. Data for 1984. Rates of growth for 1975-1984 and 1980-1984.
6. Data for 1983. Rates of growth for 1975-1983 and 1980-1983.

11. From 1975 to 1985 total scheduled air traffic (excluding domestic operations in the USSR) increased at an average annual rate of 7.5 per cent and total operating revenues at 12.7 per cent against 7.9 per cent for the world's gross domestic product and 3.6 per cent for world production of electrical energy. Scheduled air passenger traffic increased at 7.4 per cent per annum compared to 4.2 per cent for international tourist arrivals, and the rate for air freight traffic was 7.8 per cent against 3.4 per cent for world production of manufactured goods. Financial comparisons show that air passenger revenues increased at 11.2 per cent per year, whereas estimated international tourist receipts increased at 9.8 per cent. Revenue earned from the carriage of freight by air increased at 11.5 per cent a year, two percentage points more than the value of manufactured goods exported in the world.

12. The explanation for this comparatively favourable position of air transport in terms of production and revenue may be found in part in the fact that the price of these services to the user did not increase as rapidly as per capita income and the price index. The average annual rate of increase in the air passenger fare per kilometre was 3.6 per cent against 7.2 per cent for per capita income in developed market economies. In the case of freight, the rate per tonne-kilometre rose by 3.4 per cent per annum, compared to a 3.5 per cent rise in the unit price of manufactured goods exported by developed market economies.

13. Historically, the ability of the air transport industry to offer users transportation at unit prices which have increased less than those for other goods and services has been explained by improved productivity made possible by technological innovation. This continues to be true as productivity per airline employee rose at an average annual rate of 7.3 per cent between 1975 and 1985 while labour productivity in manufacturing in developed market economies increased by 3.2 per cent per year during the same period.

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Chapter 2 - OPERATORS AND THEIR FLEETS

1. There were approximately 900 commercial air carriers in the world operating at least one aircraft of more than 9 000 kilogrammes maximum take-off weight in 1985. Of these carriers, 478 performed international services, in many cases in addition to domestic services. The distribution of these carriers by region of registration and by type of operation is shown in Table 2.1.

Table 2.1

NUMBER OF INTERNATIONAL SCHEDULED AND NON-SCHEDULED AIR CARRIERS IN 1985¹
(Distribution by Region of Registration)

Region of Registration	Type of Operator						TOTAL
	Scheduled			Non-scheduled			
	Mixed	All-Cargo	Total	Mixed	All-Cargo	Total	
Africa	52	1	53	11	17	28	81
Asia and Pacific	38	1	39	14	1	15	54
Europe	50	3	53	75	10	85	138
Latin America and Caribbean	52	7	59	9	18	27	86
Middle East	13	1	14	4	2	6	20
North America	28	5	33	49	17	66	99
TOTAL	233	18	251	162	65	227	478

Note: 1. Carriers operating aircraft with a MTOW of more than 9 000 kilogrammes.

2. Of the total number of international carriers, 251 were scheduled airlines, of which 18 were specialized all-cargo operators. In addition, there were 227 non-scheduled carriers, of which 65 offered only cargo services. The largest number of scheduled airlines were registered in Latin America and the Caribbean (59), followed by Africa (53) and Europe (53). Of the non-scheduled operators, 85 were registered in Europe and 66 in North America.

The Commercial Transport Fleet

3. At the end of 1985, the scheduled and non-scheduled carriers of ICAO Contracting States 1/ had a combined fleet of about 9 400 large 2/ commercial transport aircraft for their international and domestic operations, an increase of 16 per cent over 1975 (Table 2.2). Available capacity increased during the decade by about 80 per cent on all routes and doubled for international services, reflecting the introduction of more productive aircraft. The changes between 1975 and 1985 in the size and composition of the world fleet by type and by region are given in Appendices 1, 2, 3 and 4.

Table 2.2

TOTAL COMMERCIAL TRANSPORT FLEET IN 1975, 1980 AND 1985¹
(Distribution by Aircraft Category as of 31 December)

Aircraft Category	1975		1980		1985	
	No.	%	No.	%	No.	%
<u>Jet</u>	5 145	63	6 242	72	7 070	75
SST	-	-	14	0	14	0
Wide-body	592	7	1 099	13	1 572	17
4-engine	(254)	(3)	(456)	(5)	(567)	(6)
3-engine	(324)	(4)	(523)	(6)	(561)	(6)
2-engine	(14)	(0)	(120)	(2)	(444)	(5)
Narrow-body	4 553	56	5 129	59	5 484	58
4-engine	(1 465)	(18)	(1 140)	(13)	(746)	(8)
3-engine	(1 239)	(15)	(1 765)	(20)	(1 806)	(19)
2-engine	(1 849)	(23)	(2 224)	(26)	(2 932)	(31)
<u>Turbo-Prop</u>	1 512	19	1 454	17	1 600	17
4-engine	(485)	(6)	(397)	(5)	(380)	(4)
2-engine	(1 027)	(13)	(1 057)	(12)	(1 220)	(13)
<u>Piston-engined</u>	1 456	18	1 004	11	730	8
GRAND TOTAL	8 113	100	8 700	100	9 400	100

Note: 1. Excluding China and the USSR.

Source: Appendix 1.

1/ Except China and the USSR.

2/ Defined as aircraft with a maximum take-off weight exceeding 9 000 kilogrammes.

Categories of aircraft

4. The number of jet aircraft in the world fleet increased by more than one-third, from 63 per cent of the total in 1975 to 75 per cent in 1985, while the proportion of turbo-prop aircraft declined from 19 to 17 per cent and that of piston-engine aircraft from 18 to 8 per cent.

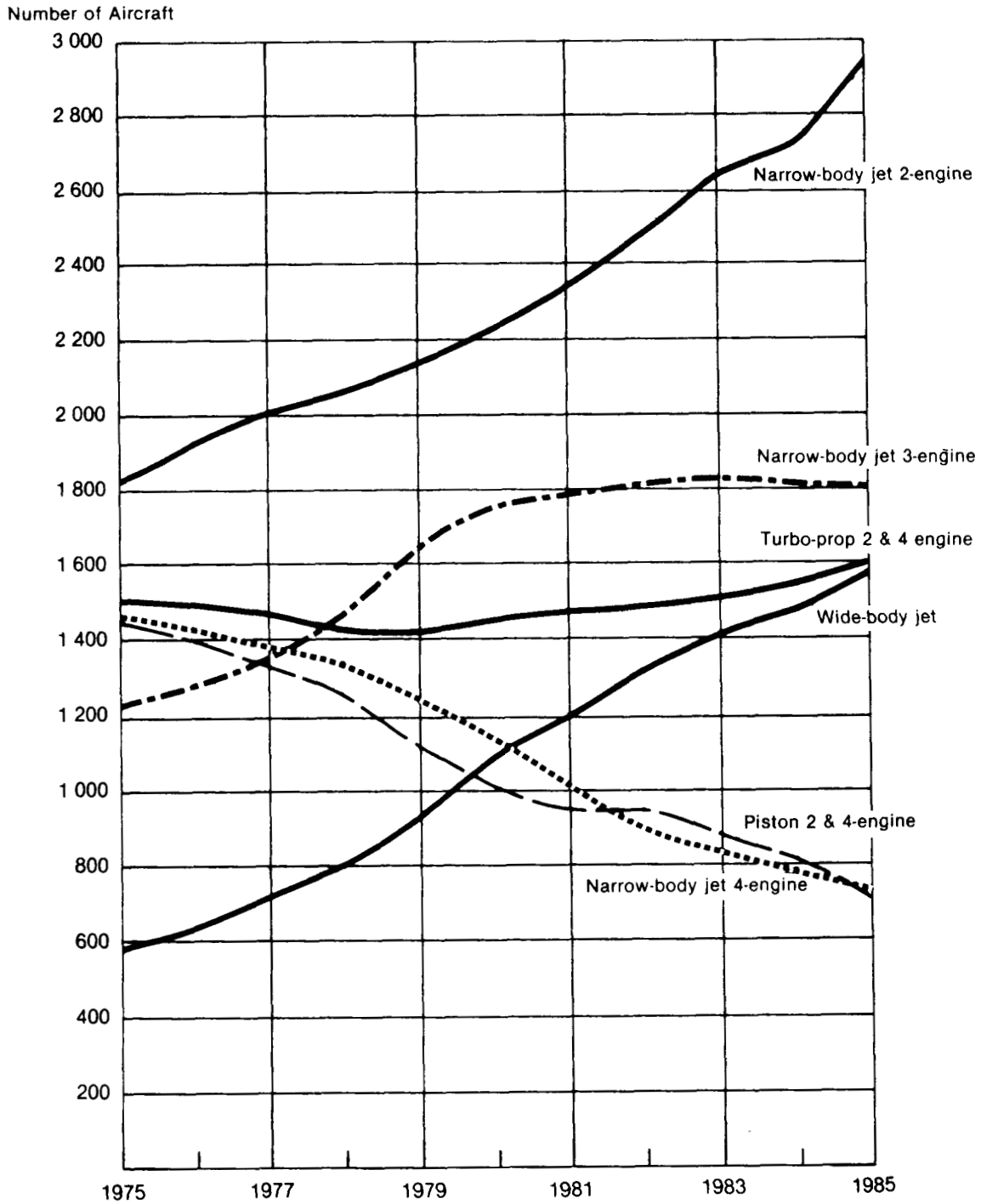
5. As illustrated in Figure 2.1, showing the changing relationship between the various categories and sub-categories of aircraft, the most important development during the decade has been the steady growth in the number of wide-body aircraft in service, from 7 to 17 per cent of the total fleet between 1975 and 1985. In a recent development certain 2-engine wide-body aircraft are increasingly being used on long-haul services. Among the category of narrow-body jets, 2 and 3-engine aircraft currently represent the two most important sub-categories, accounting respectively for 31 and 19 per cent of the world fleet. In contrast, the number of 4-engine narrow-body jets has shown a steady decline since 1975, from 18 per cent of the fleet in that year to 8 per cent in 1985. While the number of twin turbo-prop aircraft increased during the decade by 19 per cent, there has been a drop of about 22 per cent in the number of 4-engine turbo-prop aircraft. Piston-engine aircraft continued to show a steady decline in numbers between 1975 and 1985.

Regional distribution

6. The distribution of the world fleet according to region of aircraft registration is shown in Table 2.3 (derived from Appendix 2). The numbers registered vary widely from region to region, as the regions vary in size, population and economic development. Two regions, North America and Europe (excluding the USSR), account for a preponderant share of the jet aircraft, but this has declined over the decade from 77 to 71 per cent. While the number of jet aircraft increased by 14 per cent in Europe and by 35 per cent in North America, the number rose by 100 per cent in the Middle East, 86 per cent in Africa, 64 per cent in Asia and the Pacific, and 63 per cent in Latin America and the Caribbean. In 1985, three regions accounted for 84 per cent of the wide-body aircraft and for 81 per cent of the narrow-body aircraft, North America (40% and 50% respectively), Europe (22% and 24%) and Asia and the Pacific (22% and 7%).

7. The greatest changes in fleet composition during the decade 1975-1985 have taken place in the developing regions. The proportion of jet aircraft rose from 33 to 59 per cent in Latin America and the Caribbean during this period, from 44 to 67 per cent in Africa, from 46 to 65 per cent in Asia and the Pacific and from 73 to 94 per cent in the Middle East, while in Europe it changed from 70 to 78 per cent and in North America from 77 to 80 per cent. Wide-body aircraft as a proportion of the total fleet in each region were relatively most important in the fleets of the Middle East (35%) and Asia and the Pacific (30%), followed by Europe (16%), North America (15%), Africa (10%) and Latin America and the Caribbean (7%). Propeller-driven types remain important in Latin America and the Caribbean (41%), Africa (33%) and Asia and the Pacific (35%).

Figure 2.1
Composition of the World Commercial Transport Fleet
 (end of each year, 1975-1985)



Note: Excludes China and the USSR.

Table 2.3

REGIONAL DISTRIBUTION OF TOTAL COMMERCIAL TRANSPORT FLEET IN 1975 AND 1985¹
(Distribution by Aircraft Category as of 31 December)

Aircraft Category	Africa		Asia & Pacific		Europe		Latin America & Caribbean		Middle East		North America		World	
	1975	1985	1975	1985	1975	1985	1975	1985	1975	1985	1975	1985	1975	1985
<u>Numbers</u>														
SST	-	-	-	-	-	14	-	-	-	-	-	-	-	14
Wide-body	10	62	85	345	145	350	9	65	21	120	322	630	592	1 572
Narrow-body	205	338	365	395	1 325	1 306	334	495	139	200	2 185	2 750	4 553	5 484
Total jet	215	400	450	740	1 470	1 670	343	560	160	320	2 507	3 380	5 145	7 070
Other	275	200	530	390	625	470	707	390	60	20	771	860	2 968	2 330
Total	490	600	980	1 130	2 095	2 140	1 050	950	220	340	3 278	4 240	8 113	9 400
<u>Per Cent</u>	%	%	%	%	%	%	%	%	%	%	%	%	%	%
SST	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Wide-body	2	10	9	30	7	16	1	7	10	35	10	15	7	17
Narrow-body	42	57	37	35	63	61	32	52	63	59	67	65	56	58
Total jet	44	67	46	65	70	78	33	59	73	94	77	80	63	75
Other	56	33	54	35	30	22	67	41	27	6	23	20	37	25
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Note: 1. Excluding China and the USSR.

Source: Appendix 2.

Distribution by type of operator

8. The number of aircraft by category that were operated by scheduled and non-scheduled carriers in 1975 and 1985 is shown in Table 2.4 (derived from Appendix 3). Over the decade, the proportion of the total fleet operated by non-scheduled carriers remained virtually unchanged at about 14 per cent. There continues to be a marked difference in the combined fleets of the two categories of operators, with jet aircraft representing 79 per cent of the scheduled airline fleet, as against 53 per cent for the non-scheduled carriers.

Table 2.4

TOTAL COMMERCIAL TRANSPORT FLEET BY TYPE OF OPERATOR IN 1975 AND 1985¹
(Distribution as of 31 December)

Aircraft Category	Scheduled Airlines				Non-Scheduled Operators				All Operators				Non-Scheduled % of Total	
	1975		1985		1975		1985		1975		1985		1975	1985
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
<u>JETS</u>														
SST	-	-	14	0	-	-	-	-	-	-	14	0	-	-
Wide-body	572	8	1 512	19	20	2	60	5	592	7	1 572	17	3	4
Narrow-body	4 179	60	4 881	60	374	32	603	48	4 553	56	5 484	58	8	11
Total	4 751	68	6 407	79	394	34	663	53	5 145	63	7 070	75	8	9
Other	2 189	32	1 733	21	779	66	597	47	2 968	37	2 330	25	26	26
TOTAL	6 940	100	8 140	100	1 173	100	1 260	100	8 113	100	9 400	100	14	13

Note: 1. Excluding China and the USSR.

Source: Appendix 3.

Types of aircraft in service

9. The ten most important aircraft types in service with the scheduled airlines of ICAO Contracting States is given in Table 2.5 for the first and last years of the decade (see Appendix 4 for all types in each of the years 1975-1985). These aircraft represent a slowly rising proportion of the total fleet, from 70 per cent in 1975 to 71 per cent in 1985. Although the ranking of individual types has altered over this period, there has been little change in the actual composition of the group, with the Sud SE-210 Caravelle in the 1975 listing being replaced by the Airbus A-300 in 1985. Only two propeller-driven types (F-2 /FH-227 and the DC-3) continue to figure in the list. The Boeing 727 remains, as in 1975, the most widely used jet, followed by the DC-9 and the Boeing 737, which together account for 44 per cent of the world fleet. The two basic 4-engine narrow-body aircraft (the Boeing 707-720 and the DC-8) declined in number by 61 per cent during the decade, while the wide-body aircraft among the ten most important aircraft types increased by 148 per cent.

International Scheduled Airlines - Productivity

10. Some indications of productivity developments for international scheduled airlines between 1975 and 1985 are given in Table 2.6 and in the annual data in Appendices 5 and 6. The growth of 73 per cent (equivalent to an average annual growth of 5.6%) in capacity provided (item 6) was achieved with an increase of 19 per cent in the number of aircraft in service (item 2) an increase of 12 per cent in total personnel employed (item 4) and of 30 per cent in total aircraft hours flown (item 5). To a great extent these developments

Table 2.5

MAJOR AIRCRAFT TYPES IN SERVICE IN 1975 AND 1985¹
(Scheduled International and Domestic Airline Fleets)

1975			1985		
Aircraft Types	No.	%	Aircraft Types	No.	%
1. Boeing 727	1 075	16	1. Boeing 727	1 550	19
2. Douglas DC-9	720	10	2. Douglas DC-9/MD-80	1 050	13
3. Boeing 707/720	719	10	3. Boeing 737	970	12
4. Douglas DC-8	485	7	4. Boeing 747	560	7
5. Fokker/Fairchild F-27/FH-227	445	6	5. Fokker/Fairchild F-27/FH-227	375	4
6. Boeing 737	390	6	6. Douglas DC-10	320	4
7. Douglas DC-3	360	5	7. Douglas DC-3	250	3
8. Boeing 747	243	4	8. Boeing 707/720	244	3
9. Douglas DC-10	206	3	9. Airbus A-300	236	3
10. Sud Aviation SE-210	200	3	10. Douglas DC-8	230	3
Total 10 major types	4 843	70	Total 10 major types	5 785	71
Total all other types	2 097	30	Total all other types	2 355	29
Grand Total	6 940	100	Grand total	8 140	100

Note: 1. Excluding aircraft manufactured in China and the USSR.

Source: Appendix 4.

Table 2.6

DEVELOPMENTS IN PRODUCTIVITY BETWEEN 1975 AND 1985
(International Scheduled Airlines¹, including domestic and non-scheduled operations)

Items	1975	1985	% Change
1. Number of Airlines	216	251	16
2. Number of Aircraft in Fleet	5 770	6 850	19
3. Number of Flight Crew ²	87 500	106 500	22
4. Total Number of Personnel	885 000	992 000	12
Performance Data			
5. Aircraft Hours Flown ('000)	11 542	15 000	30
6. Tonne-Kilometres Available (millions)	139 113	241 000	73
7. Tonne-Kilometres Performed (millions)	66 270	152 000	129
8. Weight Load Factor (%)	48	63	31
Measures of Productivity			
9. Average Stage Distance (kilometres)	894	1 030	15
10. Average Speed (km/hr)	621	640	3
11. Average Payload Capacity (tonnes)	19	25	32
12. TKAs per Flight Hour	12 053	16 067	33
13. Hours Flown per Aircraft	2 000	2 190	10
14. TKAs per Aircraft ('000)	24 110	35 182	46
15. TKPs per Aircraft ('000)	11 485	22 190	93
16. TKAs per Employee ('000)	157	243	55
17. TKPs per Employee ('000)	75	153	104

Note: 1. Excluding China and the USSR.
2. Excluding cabin attendants.

Source: Appendix 5, ATR Forms A-1.

result from the growing use made of wide-body aircraft, a factor reflected in the increase in average payload capacity per aircraft (item 11) which has risen by 32 per cent from 19 tonnes in 1975 to about 25 tonnes in 1985. Associated with an increase of 15 per cent in the average stage distance (item 9) the average aircraft speed (item 10) increased marginally over the decade with little impact upon the general rise in total capacity.

11. The number of hours flown per aircraft (item 13) rose by 10 per cent in spite of the temporary decrease in this indicator in 1980, 1981 and 1982, which was influenced to some extent by the number of aircraft grounded by some airlines in response to high fuel costs and the disparity between traffic demand and capacity. Tonne-kilometres available per aircraft (item 14) rose by 46 per cent during the period. The decade saw a continued increase in the weight load factor (item 8), resulting in a greater improvement in productivity measured in terms of traffic carried compared to capacity produced. Tonne-kilometres performed (TKP) per aircraft (item 15) were up by 93 per cent, while TKPs per employee rose by 104 per cent.

12. In general, it may be noted that the improvements achieved between 1975 and 1985, as measured by the indicators in Table 2.6, are noticeably better than those observed in previous issues of the Triennial Review published by ICAO.

Chapter 3 - TRAFFIC

1. In 1985 the scheduled and non-scheduled carriers of ICAO Contracting States transported approximately 181 800 million tonne-kilometres of passenger, freight and mail traffic 1/ on their international and domestic services. Of this total about 92 per cent (166 600 million) was transported on scheduled services and 8 per cent on charter services. Details concerning the development of this traffic over the past decade are presented in Appendices 7 to 12.

Scheduled Traffic

Distribution by type and category of service

2. International scheduled traffic, as a proportion of total scheduled traffic, increased from 44 per cent in 1975 to 51 per cent in 1985 2/. International passenger traffic increased as a proportion of total passenger traffic from about 39 per cent in 1975 to nearly 45 per cent in 1985, while international freight traffic rose from 60 per cent of total freight traffic in 1975 to almost 74 per cent in 1985. International passengers accounted for about two-thirds of the total load on all international services in 1975 declining slightly over the decade, whereas air freight increased its share of the total load from just above 31 per cent in 1975 to 34 per cent in 1985.

3. The major emphasis in this review is placed on international air transport, but it is noteworthy that of the 1985 total domestic scheduled traffic 79 per cent is accounted for by two countries: the United States at nearly 56 per cent (44 925 million tonne-kilometres) and the USSR at over 23 per cent (18 684 million tonne-kilometres).

1/ All 1985 traffic data are preliminary.

2/ Percentages determined using tonne-kilometres performed as presented in Appendix 7.

Traffic growth by region: 1975-1985

4. Average annual rates of growth for international scheduled traffic from 1975 to 1985 are given in Table 3.1 (derived from Appendices 9A and 10) for the world and by region of airline registration, and route group. The global rates compared to those for the earlier decade 1972-1982 were lower for passenger-kilometres (8.2% against 9.2%), and for freight tonne-kilometres (9.5% against 10.4%) but higher for mail tonne-kilometres (4.3% against 3.6%). The sum of all international scheduled traffic increased from 37 343 million tonne-kilometres in 1975 to 85 540 in 1985, passenger traffic growing from 270 259 million to 593 700 million passenger-kilometres.

Table 3.1

GROWTH OF INTERNATIONAL SCHEDULED TRAFFIC BY REGION AND ROUTE GROUP: 1975-1985
(Average annual percentage increase)

Traffic Category	WORLD	Region of Airline Registration						Route Group	
		Africa	Asia & Pacific	Europe	Latin America & Caribbean	Middle East	North America	North Atlantic	Intra-Europe
Passenger-Km.	8.2	7.7	11.4	5.9	6.6	12.6	9.0	9.0	4.9
Freight Tonne-Km.	9.5	9.3	14.7	8.9	7.5	9.4	5.5	9.4	5.5
Mail Tonne-Km.	4.3	5.2	7.9	5.4	4.9	12.1	1.8	5.7	5.8
Total Tonne-Km. Perf. (TKP)	8.6	8.1	12.6	7.0	7.0	11.4	7.5	9.1	5.1

Note: 1985 data are preliminary.

Source: Appendices 9A and 10.

5. For the period under review (1975-1985) there were significant differences between the regions, the highest growth rates for all categories of traffic being achieved by the airlines of Asia and the Pacific and the Middle East, the lowest for passenger and total traffic by the European and Latin American airlines, and the lowest for freight and mail traffic by the North American airlines. The carriers of Africa showed annual rates near the world average. Traffic on the North Atlantic grew slightly faster than the world average whereas on the Intra-European routes growth was appreciably slower.

Regional distribution of international scheduled traffic

6. The changing distribution of the various categories of international scheduled traffic by region of airline registration and for two major route groups is shown for the years 1975 and 1985 in Tables 3.2 and 3.3 respectively.

7. Table 3.2 shows that more than half (57.4%) of total international scheduled traffic in 1985 was still carried by the airlines registered in Europe (37.5%) and North America (19.9%), a change from 1975 when Europe alone had close to a 44 per cent share, and the carriers of the North American region more than 22 per cent. The major gain was made by the airlines of Asia and the Pacific whose share rose from about 19 per cent to about 27 per cent.

Table 3.2

REGIONAL DISTRIBUTION OF INTERNATIONAL SCHEDULED TRAFFIC IN 1975 AND 1985
(Percentage)

Region of Airline Registration	Passenger-Km.		Freight T.Km.		Mail T.Km.		Total T.Km.		Weight Load Factor	
	1975	1985	1975	1985	1975	1985	1975	1985	1975	1985
Africa	5.1	4.9	3.5	3.4	2.5	2.7	4.5	4.3	51	50
Asia & Pacific	18.9	25.3	18.2	29.0	10.8	15.2	18.7	26.7	56	66
Europe	44.7	36.0	42.3	40.1	35.3	39.2	43.5	37.5	54	65
Latin America & Caribbean	7.2	6.2	6.2	5.1	2.5	2.7	6.6	5.7	52	55
Middle East	3.9	5.9	6.4	6.3	1.3	2.7	4.6	5.9	53	52
North America	20.2	21.7	23.4	16.1	47.6	37.5	22.1	19.9	47	56
WORLD	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	52	61

Note: 1985 data are preliminary.

Source: Appendix 9A.

Table 3.3

SHARE OF WORLD INTERNATIONAL SCHEDULED TRAFFIC
ON NORTH ATLANTIC AND INTRA-EUROPEAN ROUTES IN 1975 AND 1985
(Percentage)

Traffic Category	ROUTE GROUP			
	North Atlantic		Intra-European	
	1975	1985	1975	1985
Passenger-Km.	21	22	13	9
Freight Tonne-Km.	25	25	5	3
Total Tonne-Km.	22	23	10	7

Source: Appendices 7 and 10.

8. In spite of the decline in the share of world traffic carried by European and North American airlines, the relative importance of the North Atlantic routes where these carriers are predominant remained practically unchanged during the decade at about a quarter of the world international scheduled traffic (see Table 3.3). On the other hand, there was a significant decline in the relative importance of scheduled traffic on Intra-European routes. It should be noted however, that Intra-European routes are those on which non-scheduled traffic has been most heavily concentrated.

Traffic of individual States and airlines

9. The shares of the world's international scheduled traffic accounted for by the top 30 States or groups of States, and the top 30 airlines in 1975 and 1985 are given in Appendices 11 and 12 respectively. In 1985 these States together accounted for some 86 per cent of the total tonne-kilometres performed and the 30 airlines for more than 75 per cent. These shares were virtually the same as in 1975.

10. The average annual growth rate over the decade 1975-1985 for total international traffic was 8.7 per cent, but in the case of four States and one group of States the rate was over 15 per cent:

Saudi Arabia	25.5%
Gulf States	21.6%
Malaysia	19.8%
Indonesia	18.7%
Singapore	17.0%

Correspondingly, among the top 30 international airlines, the highest average annual growth rates for total international traffic for the period 1975-1985 were achieved by the following five:

Saudia	25.5%
British Caledonian	20.5%
Cathay Pacific	19.5%
Singapore Airlines	17.0%
Thai International	16.7%

Monthly traffic variation: 1975-1985

11. The monthly distribution of international scheduled traffic for the years 1975 to 1985 is shown in Appendix 8 for passenger-kilometres and freight tonne-kilometres performed. Monthly variations were greater for passenger than for freight traffic with about 31 per cent of the annual volume typically falling in the peak third quarter for the former in contrast with less than 28 per cent in the peak fourth quarter for the latter category of traffic. The

degree of seasonality is indicated as a traffic ratio determined by dividing the peak month by the trough month. For passenger traffic over the period under consideration this ratio fluctuated within the range of 1.68 to 1.88, while for freight traffic it fluctuated between 1.21 and 1.49. For international passenger traffic February and August have been, respectively, the trough and the peak months throughout the decade while for freight traffic January has invariably been the trough month with October being the busiest month during the last seven years of the period.

Non-scheduled Traffic

12. The global development of non-scheduled traffic has been partially masked by some reporting deficiencies among the non-scheduled air carrier group. However, the data obtained permit some indications to be given of the nature, development and importance of charter traffic.

Operational characteristics

13. In Table 3.4 a comparison is shown between non-scheduled and scheduled operations with respect to average stage distance, speed and payload capacity per aircraft for the year 1984. Compared with data presented in the previous Triennial Review for the year 1981, the average stage length for non-scheduled services decreased from over 1 500 kilometres in 1981 to about 1 200 in 1984 while in contrast it increased for scheduled operations from 1 645 to 1 683 kilometres. Also, average block speed for non-scheduled operations was slightly down whereas for scheduled it went slightly up. The average aircraft capacity for non-scheduled operations was again noticeably lower than for scheduled services.

Table 3.4

COMPARISON OF STAGE, SPEED AND CAPACITY AVERAGES
FOR SCHEDULED AND NON-SCHEDULED OPERATIONS IN 1984
(Averages per Aircraft on International Services)

Type of Operation	Stage Distance (Km.)	Block Speed (Km/hr)	Payload Capacity (Tonnes)
Scheduled	1 683	675	34.7
Non-scheduled	1 221	609	20.7

Source: ATR Forms A-1 and A-2.

Distribution of non-scheduled traffic

14. The distribution of non-scheduled traffic by category of load and services is shown in Table 3.5 for the year 1984. This type of air transport may be seen to be predominantly international, and has been primarily devoted to the carriage of passenger traffic.

Table 3.5

ESTIMATED DISTRIBUTION OF TOTAL NON-SCHEDULED TRAFFIC IN 1984¹
(Scheduled and Non-scheduled Carriers)

Type of Services	Passenger Kilometres in Millions	Tonne-Kilometres in Millions						
		Passengers		Freight & Mail		Total	Per cent Distribution	
							Passenger	Freight/ Mail
International	114 100 92%	10 270 92%	2 510 61%	12 780 89%	80%	20%		
Domestic	9 900 8%	890 8%	630 39%	1 520 11%	59%	41%		
Total	124 000 100%	11 160 100%	3 140 100%	14 300 100%	78%	22%		

Note: 1. Excluding China and the USSR.

Source: ATR Forms A-1 and A-2.

International non-scheduled passenger traffic

15. The growth rate of international non-scheduled passenger traffic averaged 1.7 per cent per year between 1975 and 1985 (Table 3.6). Non-scheduled passenger traffic, as a proportion of total international passenger traffic, decreased during the first part of the decade from a 26 per cent share in 1975 to a level of about 17 per cent since 1981. For 1985 this traffic is estimated at 118 100 million passenger-kilometres. The share of the specialized charter operators fluctuated from 1975 to 1985 between 58 and 66 per cent.

Table 3.6

ESTIMATED INTERNATIONAL NON-SCHEDULED PASSENGER TRAFFIC: 1975-1985
(Thousands of millions of passenger-kilometres)

Year	Non-scheduled Traffic ²				Scheduled Traffic	Total Traffic	Non-sched. % of Total Traffic	Per cent Change Over Previous Year		
	Non-Scheduled Carriers	Scheduled Carriers	Total Non-Scheduled Traffic	Non-sched. Carriers % Share				Non-sched. Traffic	Sched. Traffic	Total Traffic
1975	61.5	37.5	99.0	62.1	270.0	369.0	26.0	+6.2	+8.0	+7.5
1976	60.0	39.9	99.9	60.1	301.9	401.8	24.9	+0.9	+11.8	+8.9
1977	66.7	41.0	107.7	61.9	332.1	439.8	24.5	+7.8	+9.7	+9.1
1978	70.6	41.1	111.7	63.2	384.8	496.5	22.5	+5.8	+15.9	+12.9
1979	72.3	36.7	109.0	66.3	439.8	548.8	19.8	+2.4	+14.4	+10.6
1980	59.6	43.1	102.7	58.0	466.5	569.2	18.0	-17.6	+6.0	+1.8
1981	57.6	41.1	98.7	58.4	494.4	593.1	16.6	-3.4	+6.0	+4.2
1982	64.9	40.7	105.6	61.5	496.6	602.2	17.5	7.0	+0.4	+1.5
1983	69.5	37.2	106.7	65.1	510.5	617.2	17.3	+1.0	+2.8	+2.5
1984	75.2	38.9	114.1	65.9	554.2	668.3	17.1	+6.9	+8.6	+8.3
1985 ¹	68.7	49.4	118.1	58.2	593.6	711.7	16.6	+3.5	+7.1	+6.5

Notes: 1. Preliminary estimates.
2. Excluding China and the USSR.

Source: ATR Forms A-1 and A-2.

16. The relative development of non-scheduled and scheduled passenger traffic on the North Atlantic, over the period from 1975 to 1985, is shown in Table 3.7 in terms of passengers carried. The non-scheduled share of total traffic on this route decreased dramatically after 1977 to a level of between 9 and 12 per cent since 1981. The total of 2.3 million non-scheduled passengers in 1985, down by 49 per cent from the peak year 1977, represented about 14 100 million passenger-kilometres or about 12 per cent of all international non-scheduled passenger traffic.

Table 3.7

NON-SCHEDULED AND SCHEDULED PASSENGER TRAFFIC ON THE NORTH ATLANTIC: 1975-1985
(Numbers of Passengers in Thousands)

Year	Non-scheduled Operations	Scheduled Operations	Total Operations	Non-scheduled as a % of Total
1975	3 259	9 159	12 418	26.2
1976	3 678	10 156	13 834	26.6
1977	4 423	10 699	15 122	29.2
1978	3 629	13 199	16 828	21.6
1979 ¹	2 759	15 830	18 589	14.8
1980	1 925	16 650	18 575	10.4
1981	1 779	17 236	19 015	9.4
1982	2 193	16 344	18 537	11.8
1983	2 301	17 388	19 689	11.7
1984	2 674	19 469	22 143	12.1
1985	2 271	20 964	23 235	9.8
Average Annual Growth				
1975-1980	-10.0%	12.7%	8.4%	-
1981-1985	3.4%	4.7%	4.6%	-

Note: 1. As of January 1979 transatlantic flights to and from Miami included as "North Atlantic".

Source: IATA, World Air Transport Statistics, 1975-1985.

17. Intra-European non-scheduled traffic constitutes the largest single component of the 1985 world charter market (Tables 3.6 and 3.8). Its share of the total international non-scheduled passenger traffic rose from 38 per cent in 1975 to approximately 56 per cent in 1985. Within the Intra-European area (which includes the Mediterranean countries of the Middle East and North Africa) about 40 per cent of all passengers were carried on charter flights throughout the period. In terms of passenger-kilometres performed, the share of non-scheduled traffic exceeded 50 per cent. Inclusive tour charters account for about 90 per cent of the total volume of Intra-European non-scheduled traffic.

Table 3.8

INTRA-EUROPEAN INTERNATIONAL NON-SCHEDULED AND SCHEDULED PASSENGER TRAFFIC
(In Millions)

	Passengers Carried			Passenger-kilometres Performed		
	Non-scheduled operations ¹	Scheduled operations ²	Non-scheduled as a % of total	Non-scheduled operations ¹	Scheduled operations ²	Non-scheduled as a % of total
1975	25.5	37.9	40.2	38 000	34 443	52.5
1976	25.8	40.8	38.7	39 000	38 342	50.4
1977	28.1	43.9	39.0	42 000	42 985	49.4
1978	30.1	46.9	39.0	45 000	46 851	49.0
1979	33.3	49.7	40.1	50 000	49 818	50.1
1980	31.8	48.5	39.6	49 000	48 150	50.4
1981	32.3	49.8	39.3	50 000	49 449	50.3
1982	34.8	49.3	41.4	54 000	49 210	52.3
1983	37.5	49.2	43.3	60 000	49 130	55.0
1984	41.0	52.6	43.8	65 000	52 335	55.4
1985	42.0	55.9	42.9	67 000	55 645	54.6
Average Annual growth						
1975-1980	4.5	5.1	-	5.2	6.9	-
1980-1985	5.7	2.9	-	6.4	2.9	-

Note:

1. Within, to and from ECAC Member States.
2. AEA airlines only.
The number of passengers carried by charter flights after 1980 and passenger-kilometres performed throughout the period are estimated figures.

Sources: Appendix 10 and ECAC Digests of Statistics and working papers.

Distribution by carrier

18. The distribution of international non-scheduled passenger traffic by carrier is shown for the year 1984 in Table 3.9. Collectively the 15 major specialized charter operators accounted for 78 per cent of the total 75 200 millions of non-scheduled passenger-kilometres performed by this category of operator, a higher concentration of traffic than occurred with the scheduled airlines operating charters. In 1984 the top non-scheduled operators included 13 from Europe and 2 from North America. Collectively the group of 15 scheduled carriers which accounted for the most non-scheduled passenger-kilometres was geographically less homogeneous, also including airlines from Africa and the Middle East.

Table 3.9

INTERNATIONAL NON-SCHEDULED PASSENGER TRAFFIC IN 1984
(Millions of Passenger-Kilometres by Non-scheduled and Scheduled Carrier)

Rank	Non-scheduled Operators		Scheduled Airlines	
1.	Britannia (U.K.)	7 661	Dan-Air (U.K.)	5 671
2.	Condor (Germany, F.R.)	6 672	Aviaco (Spain)	4 329
3.	LTU (Germany, F.R.)	6 395	Finnair (Finland)	1 765
4.	Wardair (Canada)	5 788	Transamerica (U.S.A.)	1 585
5.	British Airtours (U.K.)	4 149	Air Canada (Canada)	1 350
6.	Sterling (Denmark)	3 923	Flying Tiger (U.S.A.)	1 204
7.	Hapag-Lloyd (Germany F.R.)	3 795	Royal Air Maroc (Morocco)	1 156
8.	Scanair (Scandinavia)	3 436	British Midland (U.K.)	1 057
9.	Monarch (U.K.)	2 858	Iran Air (Iran)	977
10.	Air Europe (U.K.)	2 779	British Airways (U.K.)	880
11.	Martinair (Netherlands)	2 428	Nordair (Canada)	862
12.	Orion (U.K.)	2 394	LOT (Poland)	775
13.	American Trans Air (U.S.A.)	2 347	Tunis Air (Tunisia)	703
14.	Air Charter (France)	2 054	Aer Lingus (Ireland)	697
15.	Spantax (Spain)	1 928	JAT (Yugoslavia)	693
Total Top 15 Carriers		58 607 (78%)		23 704 (61%)
Total Remaining Carriers		16 593 (22%)		15 196 (39%)
Total All Carriers		75 200		38 900

Source: ATR Forms A-1 and A-2.

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Chapter 4 - FINANCIAL TRENDS

1. The analysis of financial data given in this chapter is based primarily on the statistics presented in Appendices 13-17. The main purpose is to indicate general trends for the decade from 1975 to 1984, preliminary estimates for 1985 being given where possible. The treatment is global in nature, dealing with totals and averages for the airlines as a whole, and for this reason does not show the wide differences that exist between individual carriers. Since the available information on non-scheduled operators is incomplete the analysis is confined to the scheduled airlines of ICAO Contracting States.

2. The steep increase in the cost of fuel and the worldwide economic recession were the main factors adversely affecting the financial environment of the air transport industry in the middle of the period. The result was a net loss of more than \$4 billion between 1980 and 1983. However, during the last several years a decrease in fuel costs, along with other cost reduction and yield control measures, brought about a remarkable improvement in the financial results of the industry.

Operating Revenues, Expenses and Results

Trends

3. From 1975 to 1985, in terms of current money values and as shown in Table 4.1, the total operating revenues of the world's scheduled airlines on all their services, scheduled and non-scheduled, increased at the average annual rate of 11.3 per cent from \$38 309 million to \$112 000 million. During the same period the corresponding total operating expenses increased at a near similar rate of 11.1 per cent from \$37 579 million to \$108 000 million. Operating surpluses, ranged between 2 and 5 per cent of operating revenues with the exception of 1980, 1981 and 1982 when marginal operating losses were experienced (Table 4.2). For the period as a whole, the operating profit was \$19 063 million or more than 2 per cent of the aggregate operating revenues of \$860 585 million, and the aggregate net surplus (after allowing for non-operating items such as the retirement of property, subsidies, interest charges and income taxes) was less than 0.5 per cent of operating revenues. The growth in the development of world airline operating revenues during this period resulted from the average annual growth in traffic of 7.2 per cent in terms of tonne-kilometres performed and the rise in airline yields (average operating revenue per tonne-kilometre performed) from 24.8 cents in 1975 to 40.6 cents in 1985 (at an average annual rate of 3.9 per cent). The more rapid (5 per cent on average) growth of unit costs (average operating expenses per tonne-kilometre of available capacity) was offset by steadily increasing load factors.

Table 4.1

OPERATING REVENUES AND EXPENSES FOR SCHEDULED AIRLINES

Year	Operating Revenues (\$ million)	Operating Expenses (\$ million)	Total Traffic All Services (TKP million)	Unit Revenue (cents/TKP)	Total Capacity All Services (TKA million)	Unit Cost (cents/TKA)
<u>TOTAL SERVICES</u>						
1975	38 309	37 579	77 322	49.5	151 297	24.8
1985 ¹	112 000	108 000	154 968	72.3	266 057	40.6
Average annual growth %	11.3	11.1	7.2	3.9	5.8	5.0
<u>INTERNATIONAL SERVICES</u>						
1975	20 197	20 298	41 275	48.9	76 880	26.4
1984	55 670	52 780	86 125	64.6	138 979	38.0
Average annual growth %	11.9	11.2	8.5	3.1	6.8	4.1

Note: 1. Preliminary estimates.

Source: Appendices 13 and 14.

4. For international services alone revenues and expenses for 1985 have not been estimated, but for the period from 1975 to 1984 it may be seen from Table 4.1 that total operating revenues increased at a higher rate than operating expenses. Throughout this period the aggregate operating profit of the world's scheduled airlines on their international services amounted to \$5 876 million, about a 1.5 per cent of their aggregate operating revenues. However, the net result for the period was a cumulative loss of \$2 337 million or approximately 0.6 per cent of total operating revenues. For international operations, average yields increased at an annual rate of 3.1 per cent from 48.9 cents per tonne-kilometre performed in 1975 to 64.6 cents in 1984 while the unit cost rose from 26.4 cents per tonne-kilometre available in 1975 to 38.0 cent in 1984, or by 4.1 per cent annually. Concurrently, traffic increased at the rate of 8.5 per cent and capacity by 6.8 per cent per annum.

Table 4.2

OPERATING AND NET RESULTS OF SCHEDULED AIRLINES: 1975-1985

Year	ALL SERVICES				INTERNATIONAL SERVICES ONLY			
	Operating Result		Net Result		Operating Result		Net Result	
	In Millions of US Dollars	As % of Operating Revenue	In Millions of US Dollars	As % of Operating Revenue	In Millions of US Dollars	As % of Operating Revenue	In Millions of US Dollars	As % of Operating Revenue
1975	730	1.9	-67	-0.2	-101	-0.5	-576	-2.9
1976	2 156	5.0	825	1.9	599	2.6	66	0.3
1977	2 628	5.2	1 656	3.3	958	3.6	487	1.8
1978	3 100	5.3	2 412	4.1	1 085	3.3	668	2.0
1979	736	1.0	588	0.8	478	1.2	280	0.7
1980	-635	-0.7	-919	-1.0	-1 221	-2.4	-1 696	-3.4
1981	-692	-0.7	-1 150	-1.2	-959	-1.9	-1 565	-3.0
1982	-160	-0.2	-1 300	-1.4	290	0.6	-756	-1.5
1983	2 100	2.1	-700	-0.7	1 872	3.5	-414	-0.8
1984	5 100	4.9	2 000	1.9	2 875	5.2	1 169	2.1
1985 ¹	4 000	3.6

Note: 1. Preliminary estimates.

Source: Appendices 13 and 14.

Annual variations

5. The overall trends cited in the foregoing paragraphs were not constant throughout the period. For international and domestic services combined, the annual percentage growth rates of operating revenues per tonne-kilometre performed and operating expenses per tonne-kilometre available showed considerable variation with an increase in both figures exceeding 20 per cent in 1980, mainly due to the second fuel crisis, and with their slight decrease in 1982 through 1984 (Figure 4.1). This latter trend was partly due to the airlines' efforts to control costs and stimulate traffic with promotional tariffs, and partly due to expressing the data in U.S. dollars which appreciated against most other currencies.

6. As shown in Table 4.2, operating results expressed as a percentage of revenues, fluctuated from a high of more than 5 per cent for all services during the years 1976 through 1978 to losses of less than 1 per cent in 1980, 1981 and 1982. Net results for all services fluctuated from a profit of 4.1 per cent of operating revenues in 1978 to a loss of 1.4 per cent in 1982.

7. Between 1975 and 1981 the operating result for international services only, expressed as a percentage of operating revenue, was considerably lower than the operating result for all services; however, since 1982 it has been consistently higher (Table 4.2). In 1984, for the first time during the decade, the net result for international operations, expressed as a percentage of revenue, also exceeded the net result for all services (2.1 per cent and 1.9 per cent respectively). It is noteworthy that in both 1982 and 1983 the operating expenses for the international services of the world's scheduled airlines showed unprecedented decreases from previous year levels, testifying to the success of airlines' efforts to control costs.

Level and Distribution of Revenue and Expense Items

8. The levels of individual expense and revenue items expressed in cents per tonne-kilometre performed and available are given in Appendices 13 and 14. For the world's domestic and international services combined, unit passenger and freight revenues per tonne-kilometre performed developed at similar rates during the past ten years, about 7.5 per cent of increase per annum during the first five years and less than 1 per cent of decrease per annum during the second five years. Unit mail revenues increased at the average annual rate of about 2 per cent for the decade. The yields from non-scheduled services increased at an average annual rate of 5 per cent throughout the 1975-1985 period. In terms of shares of total revenues, passenger and freight revenues accounted for similar proportions in 1985 as in 1975, respectively about 79 and 11 per cent (see Table 4.3), whereas the share for mail and non-scheduled revenues declined from 6.3 per cent to 3.3 per cent and that for incidental revenues shifted from 4.0 to 6.3 per cent.

Figure 4.1
 Financial Data for Scheduled Airlines
 (1975-1985)

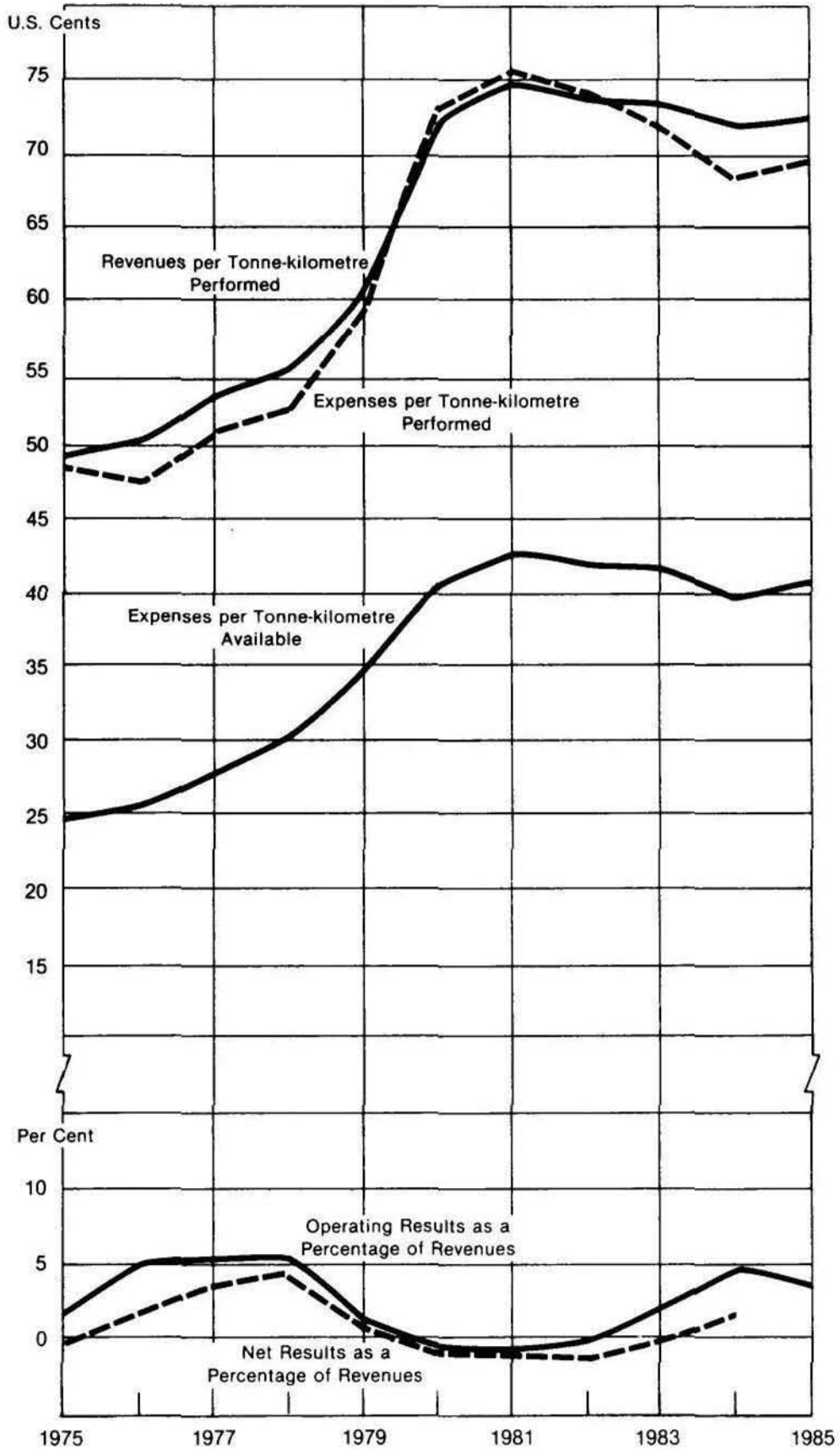


Table 4.3

PERCENTAGE DISTRIBUTION OF OPERATING REVENUES AND EXPENSES
IN 1975 AND 1984

Description	All Services		International Only	
	1975	1984	1975	1984
<u>OPERATING REVENUES</u>				
Scheduled services				
Passenger	78.8	77.6	69.9	71.0
Cargo	10.9	11.9	14.0	14.3
Mail	2.1	1.4	2.4	1.5
Sub-total	91.8	90.9	86.3	86.8
Non-scheduled	4.2	2.8	6.7	4.7
Incidental	4.0	6.3	7.0	8.5
Total	100.0	100.0	100.0	100.0
<u>OPERATING EXPENSES</u>				
Direct aircraft				
Flight operations	32.5	33.2	31.5	32.0
Flight crew	8.8	6.9	7.3	5.1
Fuel and oil	19.4	23.3	19.5	22.7
Other	4.3	3.0	4.7	4.2
Maintenance and overhaul	12.5	10.1	11.6	10.2
Depreciation and amortization	8.1	7.2	8.5	7.6
Sub-total	53.1	50.5	51.6	49.8
Indirect				
User charges and station expenses total	16.9	16.1	15.7	14.8
Landing and associated airport charges	3.8	3.1	4.5	3.8
En-route facility charges	°°°	1.4	°°°	2.0
Station expenses	13.1 ¹	11.6	11.2 ¹	9.0
Passenger services	9.4	9.2	9.2	9.4
Ticketing, sales, promotion	14.6	16.6	16.5	18.0
General and admin. and other operating expenses	6.0	7.6	7.0	8.0
Sub-total	46.9	49.5	48.4	50.2
Total	100.0	100.0	100.0	100.0

Note: 1. Includes en-route facility charges.

Source: Appendices 13 and 14.

9. Among airline operating expense items the greatest percentage increase during the 1975-1985 period was in "general, administrative and other expenses" which rose at an average annual rate of 14.2 per cent compared with 13.1 per cent for the cost of aircraft fuel and oil (Appendix 13). However, the latter grew between 1975 and 1981 by 24.6 per cent per annum on average and declined in the last four years at an average rate of 2.2 per cent. As a result, this item increased from 19.4 per cent of total operating expenses in 1975 to 29.2 per cent in 1981 and decreased to 23.1 per cent in 1985 (see Table 4.3). The items which increased the least (each of them at about 8.5 per cent per year on average) were flight operations less fuel and oil, cost of maintenance and overhaul, and landing and associated airport charges (Appendix 13).

Regional distribution of revenues and expenses

10. Estimates of the distribution of total operating revenues and expenses according to the region of airline registration are given in Table 4.4 for 1975 and 1984 together with the corresponding operating results. The airlines of Asia and the Pacific and of Middle East increased their shares of the industry operating revenues and expenses by more than 40 per cent, recording in 1984 17 and 5 per cent respectively of the world totals. The North American airlines retained their share and accounted in 1984 for 45 per cent of the world operating revenues and expenses compared with 43 per cent in 1975. The European airlines' contribution to the world totals declined from 32 per cent in 1975 to 24 per cent in 1984. The relative financial significance of the African and Latin American carriers also decreased, their shares tending to remain below 5 per cent of the industry operating revenues and expenses.

Table 4.4

REGIONAL DISTRIBUTION OF TOTAL OPERATING REVENUES AND EXPENSES IN 1975 AND 1984¹

Region of Airline Registration	Year	Operating Revenues		Operating Expenses		Operating Result		
		Millions of US \$	% of World	Millions of US \$	% of World	Millions of US \$	% of World	% of Operating Revenues
Africa	1975	1 520	4.0	1 423	3.8	97	13.3	6.4
	1984	3 650	3.5	3 750	3.8	-100	-2.0	-2.7
Asia and Pacific	1975	4 783	12.5	4 593	12.2	190	26.0	4.0
	1984	18 200	17.4	17 000	17.1	1 200	23.5	6.6
Europe ²	1975	12 015	31.4	11 931	31.7	84	11.5	0.7
	1984	25 500	24.3	24 000	24.1	1 500	29.4	5.9
Middle East	1975	1 304	3.4	1 184	3.2	120	16.5	9.2
	1984	5 100	4.9	5 050	5.0	50	1.0	1.0
North America	1975	16 453	42.9	16 293	43.4	160	21.9	1.0
	1984	47 200	45.0	44 850	45.0	2 350	46.1	5.0
Latin America and Caribbean	1975	2 234	5.8	2 155	5.7	79	10.8	3.5
	1984	5 150	4.9	5 050	5.0	100	2.0	1.9
WORLD	1975	38 309	100.0	37 579	100.0	730	100.0	1.9
	1985	104 800	100.0	99 700	100.0	5 100	100.0	4.9

Notes: 1. These estimates are based on the financial data reported to ICAO which is incomplete for some regions.
2. Excluding domestic operations within the USSR.

Source: ICAO Digests of Statistics, Series F, Financial Data.

Balance sheet

11. Over the 1975-1985 period assets and liabilities of the world airlines increased slightly slower than operating revenues, on average at 10.5 per cent per annum. Throughout the period flight equipment and current assets contributed about 80 per cent of total assets, while on the liabilities side two main groups, long-term debts and current liabilities, together accounted for about 65 per cent of all liabilities. The share of the largest item on the balance sheet of the world airlines, flight equipment, decreased between 1975 and 1985 from about 50 per cent to approximately 47 per cent of total assets. Among assets, special funds, deferred charges and land showed the highest growth rates (more than 13 per cent) while investments in affiliated companies grew annually at only 6 per cent. Among liabilities, the fastest growing (about 14 per cent per year) were reserves (with the exception of the self-insurance reserve which showed the slowest rate of growth of 7.5 per cent).

12. The current ratio of the industry balance sheet, a common measure of its ability to meet current obligations, was slightly worse in 1985 than in 1975 - 1.01 and 1.07 respectively. However, compared with its lowest value (0.83 in 1981) considerable improvement has occurred over the last four years. The same may be said about the debt-equity ratio which deteriorated from 1.83 in 1975 to 2.49 in 1982 and then improved to 1.46 in 1985.

Productivity

13. The development of productivity, viewed in financial terms, may be seen by a year to year comparison of operating revenues earned per dollar of assets (Appendices 13 and 15). This ratio, which was 0.93 in 1975, increased to 1.06 in 1980 and 1981, and declined to 1.00 for 1983-85.

14. Appendix 16 presents data on flight crew productivity and costs for international scheduled airlines for the years 1975 to 1984. Throughout this period the number of flight crew members needed for every 1 000 aircraft hours remained substantially the same at around 7.5. Between 1975 and 1981 crew costs per hour flown increased at an average annual rate of 11.1 per cent (from \$265 to \$498) whereas crew costs per tonne-kilometre available grew at the much lower average annual rate of 5.9 per cent due to increases in average aircraft capacity and speed. From 1982 to 1984, both of these indicators declined at about the same rate (of approximately 5 per cent per year).

15. In Appendix 17, some examples are given of productivity changes from 1975 to 1985 in terms of tonne-kilometres of capacity produced per employee and per dollar of remuneration for 15 major international airlines from the six ICAO regions. Average remuneration per employee, for example, varied greatly

among airlines from about \$1 854 to \$16 559 in 1975 and from \$4 165 to \$45 612 in 1985. Average tonne-kilometres of capacity per employee varied from 42 000 to 266 000 in 1975 and from 90 000 to 433 000 in 1985. It may be observed for both 1975 and 1985 that airlines with higher average remuneration tend to achieve greater productivity. The differences in terms of tonne-kilometres of capacity produced per dollar of remuneration varied from 8 to 31 in 1975 and from 5 to 27 in 1985 and by this measure productivity appears to be inversely related to the level of remuneration. When considering these statistics it should be borne in mind that the employment and salary data for different airlines are not provided on a completely uniform basis.

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CHAPTER 5 - TRENDS AND PROSPECTS

1. Over the past ten years (1975-1985) world scheduled air traffic has grown at an average annual rate of about 7.0 per cent per annum. This chapter examines the prospects for future growth of passenger and freight traffic in light of likely developments in world economic growth, costs and other factors expected to affect air transport activity. The forecasts are presented on a global and regional basis but no predictions of the volume of traffic on particular routes, and at particular airports, are attempted because these would require extensive individual examination as well as analysis of network factors.

Summary of Main Trends

2. Passenger traffic trends observed over the past decade and expected during the next decade are illustrated graphically in Figure 5-1. Total world passenger-kilometres flown on scheduled services are expected to grow at an average annual rate of about 7.0 per cent over the 1985 to 1995 period. This is considered to be the "most likely" rate, with a "low" rate of 5.0 per cent per annum and a "high" rate of 9.0 per cent per annum outlining a range of future growth prospects. International scheduled traffic is expected to grow at an average rate of 8.0 per cent per annum and domestic scheduled traffic at a lower rate of 6.0 per cent. Growth in terms of numbers of passengers carried is expected to be about 1.5 percentage points lower than growth in passenger-kilometres.

3. Freight traffic trends, past and future, are illustrated in Figure 5-2. World scheduled freight traffic, measured in tonne-kilometres, is projected to grow at a "most likely" rate of 7.5 per cent per annum with "low" and "high" rates of 5.5 and 9.5 per cent per annum, respectively. For the international and domestic components, the "most likely" rates are 9.0 and 4.0 per cent per annum, respectively. Freight growth in terms of numbers of tonnes carried is expected to be about 2.5 percentage points lower than growth in tonne-kilometres.

External Factors Affecting Traffic Growth

4. Many factors influence the level and structure of demand for air transport. Some of these are external to aviation such as general economic activity, international trade, exchange rates and tourism.

Figure 5.1

TRENDS IN WORLD SCHEDULED PASSENGER TRAFFIC
(ICAO Contracting States)

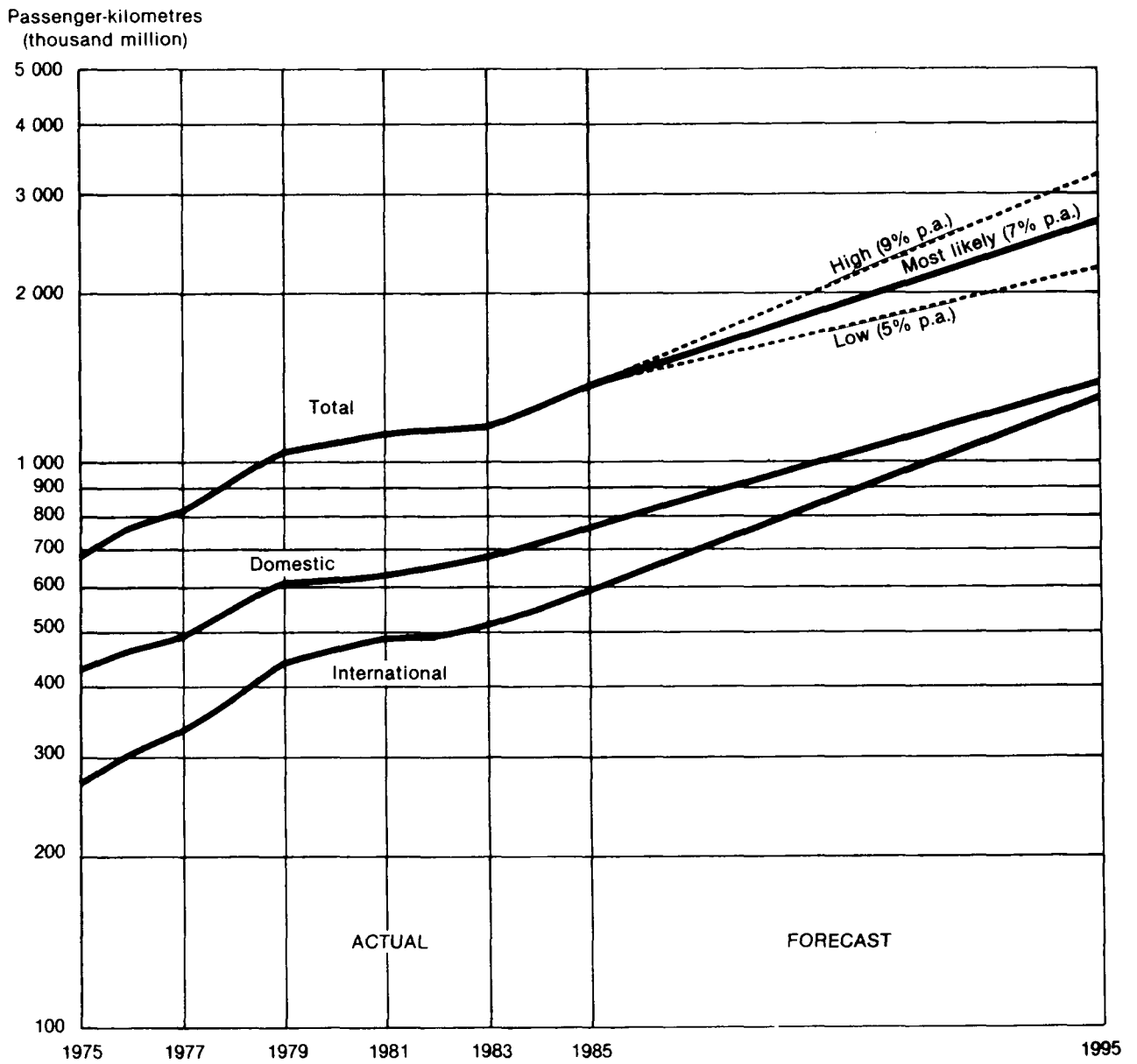
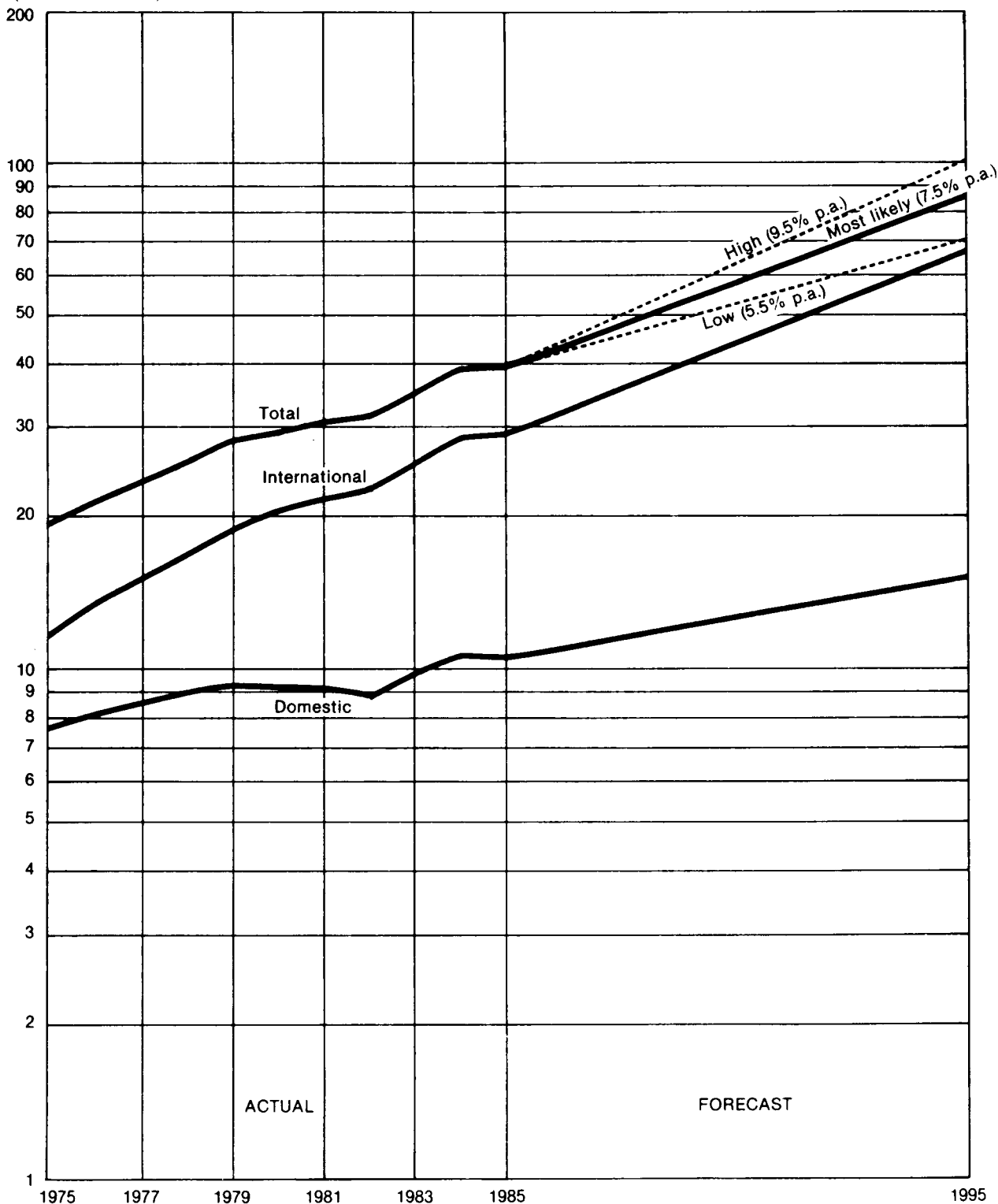


Figure 5.2
TRENDS IN WORLD SCHEDULED FREIGHT TRAFFIC
 (ICAO Contracting States)

Freight Tonne-kilometres
 (thousand million)



Economic outlook

5. The long-term demand for air transport is primarily determined by the economic developments in the world. Developments in personal income affect the level of consumer purchasing power and the propensity to undertake leisure travel. Business activity and trade have a direct impact on business travel and air freight traffic. Between 1960 and 1973, the world economy grew at an average annual rate of about 5.0 per cent in real terms, and air traffic at about 13.0 per cent. Between 1973 and 1985, world economic growth averaged only 2.5 per cent per annum in real terms and air traffic growth averaged 7.0 per cent per annum. The link between economic growth and air transport demand observed over the longer term is also apparent in shorter term cyclical movements. Figure 5-3 illustrates the fluctuations in the rate of development of air traffic and in the rate of economic growth for the period 1973-1985. Also shown in Figure 5-3 are the movements in crude oil prices, in real terms. The link between the oil price rises in 1973/74 and 1979/80 and the two worldwide economic recessions during this period, and the 1982-1985 gradual decline in oil prices and the corresponding economic growth are clearly illustrated. Crude oil prices have influenced air transport through their influence on general economic growth and, more directly, air transport costs.

6. The growth of real Gross National Product in 1984 was approximately 5.0 per cent, the best performance of the economy since 1976. The International Monetary Fund (IMF) expects growth of about 3.0 per cent worldwide in 1986 with higher growth rates in succeeding years. Concerning the longer term outlook, two simulations were performed by the World Bank in its World Development Report, 1985. In both simulations it was assumed that developing countries will continue to implement policies required for structural adjustment in the areas of key economic indicators, exchange rates and trade policies. Table 5-1 summarizes the World Bank economic growth prospects over 1985-1995 period as well as economic growth prospects for the world as a whole, developed by ICAO to reflect these scenarios. In this study, the "most likely" forecasts of traffic growth are based on a rate of world economic growth of 3.3 per cent per annum in real terms over the forecast period.

International trade

7. The level of trade, which affects business travel and air freight traffic, is closely associated with the level of economic activity, although international trade has tended to grow more rapidly than Gross Domestic Product (GDP) in real terms. This is particularly true of trade in manufactured goods and other products suitable for shipment by air. The value of the world international merchandise trade in real terms grew at an average annual rate of about 8.0 per cent between 1960 and 1973 and about 3.3 per cent between 1973 and 1985. World scheduled air freight traffic grew at about 17.0 per cent and 7.0 per cent per annum over the same two periods.

Figure 5.3
ANNUAL GROWTH IN WORLD GDP AND
WORLD AIR TRAFFIC AND TREND IN OIL PRICES

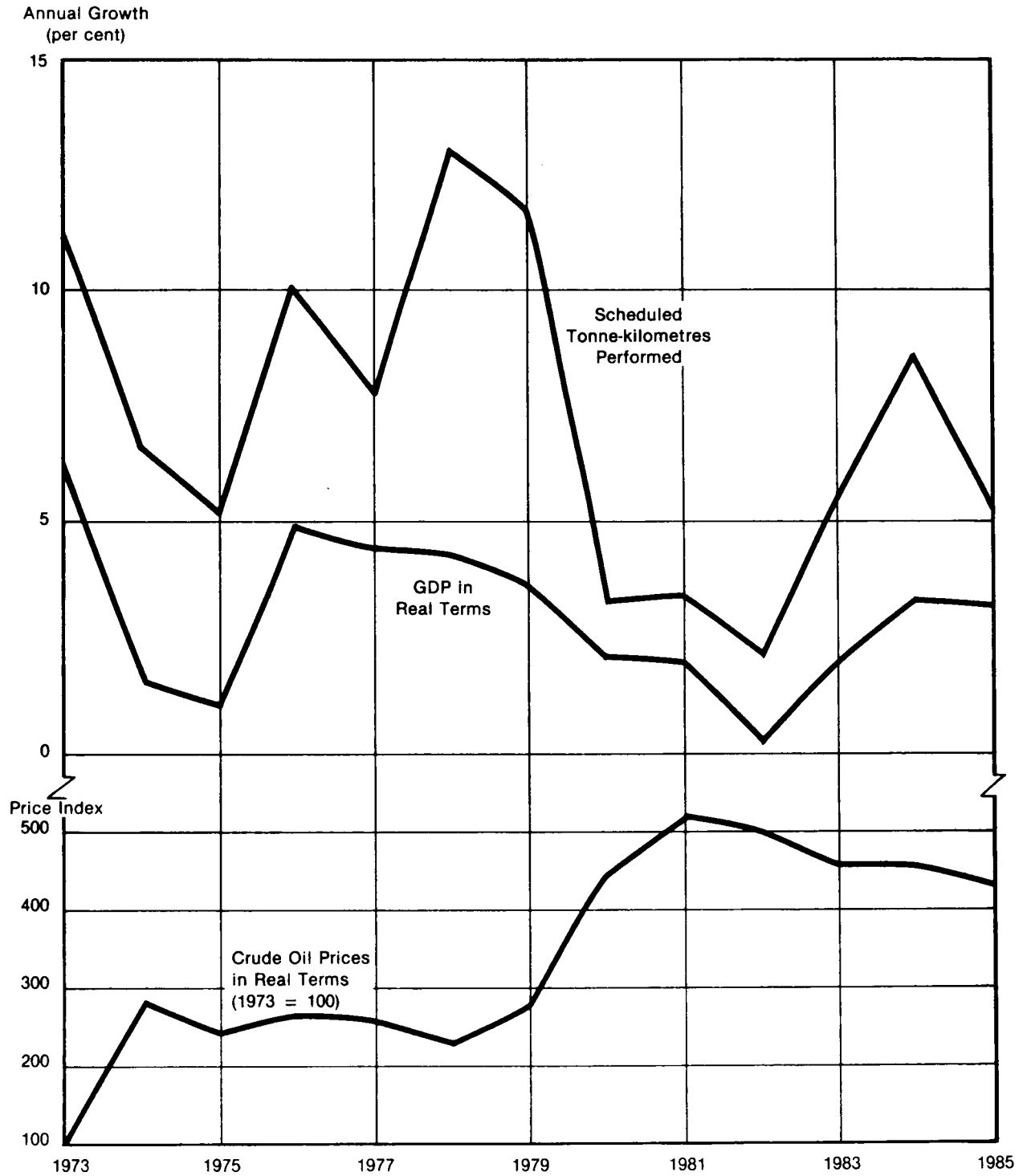


Table 5-1

GROWTH OR REAL GROSS DOMESTIC PRODUCT GDP, 1973-1995
(Average annual growth rates, per cent)

	Actual		Forecast	
	1973-1980	1980-1985	1985-1995 High	Low
Developing Countries	5.5	3.0	5.5	4.7
Industrialized Countries	2.8	2.3	4.3	2.5
Middle Income Oil Importers	5.9	2.1	6.3	5.2
Middle Income Oil Exporters	5.8	1.8	5.4	4.7
Total World*			High 4.5	Base 3.3 Low 2.3

Source: The World Bank "World Development Report, 1985".

* ICAO estimate based on World Bank data.

8. In its 1985 report, the World Bank drew attention to the possibility of increased protection of certain manufacturing industries by various countries, and indicated that the medium-term prospects were for relatively slow growth in world trade. For the purposes of this study, an average annual rate of growth of about 4.0 per cent over the period 1985 to 1995 is assumed. This rate is approximately 1.0 per cent above the growth rate established for GDP.

Tourism

9. An important element of air passenger traffic is travel for leisure and other personal reasons. The demand for such travel, which is closely related to disposable income, has tended to grow at a faster rate than overall economic activity and governments generally and the travel industry have actively promoted it through tourism policy and provision of appropriate infrastructure and travel arrangements. It may be expected that with continued economic growth and tourism promotion the demand for air travel for personal reasons will continue to increase at a comparatively fast rate.

Industry Factors Affecting Traffic Growth

10. Industry factors, including airline operating costs, capacity utilization and regulatory policies, also influence the demand for air transport through the price, quantity and quality, of air services provided.

Fares and rates

11. Historically the air transport industry has been able to reduce fares and rates, measured in real terms, and this has contributed to traffic growth. Over the 1975-1985 period revenue yield per tonne-kilometre performed, which is an approximate measure of average fare and rate levels, declined at an average annual rate of about 7.0 per cent in real terms. Reduced units operating costs and increased load factors have been contributory factors to the decline in yields over the period, as illustrated in Figure 5-4.

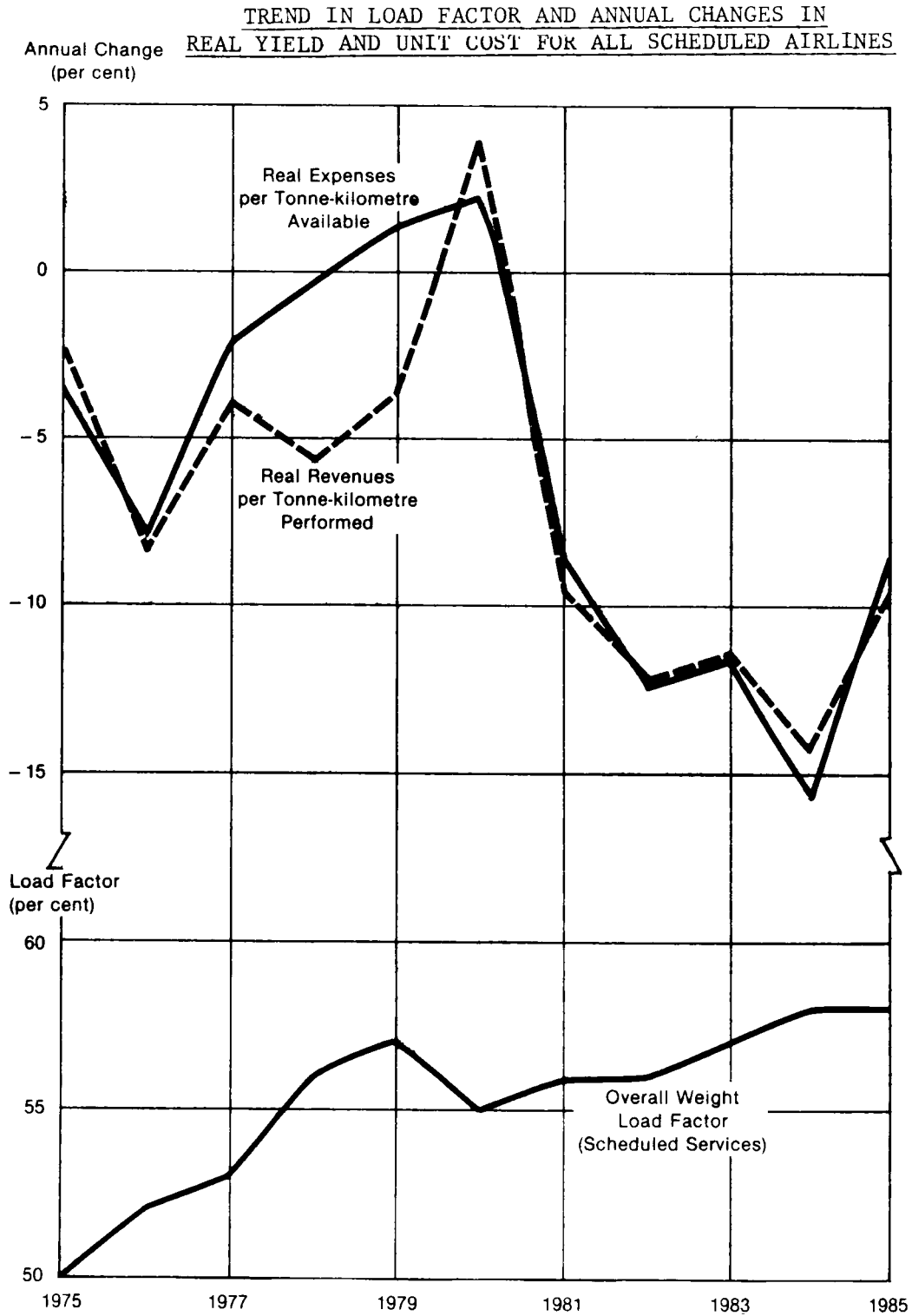
Airline costs

12. Measured in real terms, total operating costs per available tonne-kilometre for the world scheduled airlines are estimated to have declined by about 6.5 per cent per annum between 1975 and 1985. Although unit costs rose sharply in 1974 and again in 1979 and 1980 (see Figure 5-4) mainly due to the rises in the price of oil, increased efficiency resulting mainly from the progressive replacement of older aircraft with larger more efficient aircraft assured a decrease in unit costs over the period as a whole.

13. Airline equipment programmes, covering replacement and expansion, are influenced by the need to meet anticipated growth in demand in the most efficient and competitive manner, and to take advantage, where possible, of economies offered by new aviation technology. Numerous airframe and engine developments are presently occurring over a wide range of aircraft payload/range categories. The recent introduction into airline service of several types of new fuel-efficient aircraft in the 180-230 seat range is of particular significance for the trend in unit costs over the forecast period. Improved airline financial results should accompany a sustained recovery in the general economy and in air traffic demand, making possible continued injection of renewed ordering of new equipment. However, the magnitude of the improvements in cost efficiency resulting from fleet developments may be less than in the past due to the high capital cost of the new aircraft.

14. During the period 1973-1974 and 1979-1981, large increases in fuel prices have seriously affected airline costs, which accounted for about 25-30 per cent of total operating costs. In 1985, fuel accounted for approximately 23.0 per cent of total operating costs. However, after gradual declines during the period 1982-1985, oil prices declined in late 1985 and in 1986 by about a third. The broader economic implications of this oil price fall are generally good for air transportation, and should translate into an overall operating cost reduction. Although the long term outlook for fuel prices is not clear, prevailing industry expectations are for moderate increases in current terms during the forecast period which will have a relatively small impact on real operating costs.

Figure 5.4



Load factors

15. During the 1970s improved load factors made possible a more rapid decline in average fares and rates, in real terms, than the decline in unit costs. This was particularly true between 1976 and 1979, as illustrated in Figure 5-4. An increase in load factors of approximately 16 percentage points was achieved over the period 1975 to 1985. The wider availability of low promotional fares, together with improved load control, have been major factors contributing to this development. However with the average passenger load factor on all scheduled services currently at about 66.0 per cent, the scope for further improvements appears limited. Consequently, although the use of promotional fares may be expected to continue, their impact may be less than during the 1970s.

Price competition

16. During the period 1980-1982, world airline industry as a whole incurred substantial operating losses partly a result of vigorous price competition during a period of sluggish demand and excess capacity. Yield increases lagged costs during periods of rising fuel prices. This trend has reversed as demand recovered during 1983-1985 period with the general upturn of economic activities and productivity increases. Taking into account the various cost and demand factors affecting the future price of passenger and freight transport, it is assumed that fares and rates will decline at an average annual rate of about 1.5 per cent, in real terms, during the period 1985-1995.

Availability of airline services

17. After a long period of expansion of scheduled services through the addition of new routes and increased service frequencies, there was a significant decline in the number of aircraft departures and aircraft-kilometres flown in 1981 and 1982 because of low growth in demand and poor financial results. During the period 1983-1985 the number of aircraft kilometres flown and number of aircraft departures again increased significantly as demand resumed its growth. In addition to being a response to improved traffic and profitability, service improvements should themselves stimulate demand.

Factors affecting air freight

18. In addition to the external and internal factors mentioned above, air freight growth will be influenced by increased containerization, improved inter-modal coordination, more liberal service patterns and marketing developments. The increasing use of wide-body aircraft for passenger services has created extra capacity for freight on these services as well as a greater ability to carry larger shipments with greater frequency. It is assumed that the impact of these various factors will continue.

Air Traffic Forecasts by Other Organizations

19. Some recent long-term forecasts by major airframe and engine manufacturers of growth in world scheduled traffic, international and domestic traffic together, are given in Table 5-2. These forecast growth rates are in the range of 4.0 to 6.4 per cent per annum for passenger traffic with freight traffic generally forecast to grow at a slightly higher rate.

20. Separate forecasts for the number of passengers and freight tonnes carried on international routes by member airlines are regularly prepared by the International Air Transport Association (IATA), the most recent of which cover the 1984-1989 period. These indicate an average growth of 5.6 per cent per annum for international passengers and 4.9 per cent per annum for international freight tonnes. In terms of passenger-kilometres and freight tonne-kilometres, the forecasts are expected to be higher.

Table 5-2

AVAILABLE FORECASTS OF WORLD SCHEDULED TRAFFIC GROWTH
(Average annual growth rates, per cent)

Source of Forecast	Forecast Period	Passenger-Kilometres	Freight Tonne-Kilometres
Airbus Industrie	1985-1995	5.2	
Boeing	1984-1995	6.2	
General Electric	1985-1993	4.0	
Lockheed	1985-1995		4.6
McDonnell-Douglas	1985-1994	6.4	7.1
Pratt and Whitney	1985-1995	4.9	
Rolls-Royce	1985-1995	5.6	

Note: These forecasts exclude USSR traffic. The Boeing forecast includes non-scheduled traffic, McDonnell-Douglas and Rolls-Royce forecasts include all services and Lockheed forecast is for all-cargo traffic only.

Sources: Airbus Industrie, Market Environment, June 1985.

Boeing Commercial Airplane Company, World Travel Market Perspective and Airplane Equipment Requirements, February 1986.

General Electric Company, Aircraft Engine Group, March 1984.

Lockheed-Georgia Company, Civil Cargo Forecast through the Year 2000, February 1983.

McDonnell-Douglas Corporation, Outlook for Commercial Aircraft, 1985-1999, September 1985.

Pratt and Whitney, January 1986.

Rolls-Royce Limited, Market Potential for Commercial Passenger Aircraft 1983-1997, January 1983.

Forecasting Methodology

21. As a basis for the preparation of the traffic forecasts for this study econometric analyses were carried out of the effects of underlying factors on the historic aggregate demands for scheduled passenger and freight traffic. These analyses were used to translate expectations of future world economic development and future trends in international trade and average fares into projections of future traffic demand. The projected traffic growth rates were then reviewed in light of the results of other forecasts, and prospective changes in other factors which could not be accommodated in the econometric analysis.

22. More detailed projections for international and domestic scheduled traffic for the airlines of each geographical region were initially developed from the forecasts of total scheduled traffic by analyzing historic traffic trends and market shares of the individual geographical region. These projections were then calibrated in light of recent ICAO regional traffic forecasts, national traffic forecasts and other relevant information affecting the traffic prospects of airlines in each of the regions.

23. The procedures described above relate to traffic forecasts in terms of passenger-kilometres performed and freight tonne-kilometres performed. In addition, forecasts of the numbers of passengers carried and freight tonnes carried were prepared for total scheduled international and domestic services. These were derived from the forecasts of passenger-kilometres and tonne-kilometres on the basis of expectations of future trends in the average length of haul for the various types of services, in different geographical regions.

Main Assumptions

24. The following are the main assumptions concerning trends over the next decade in the factors which underly traffic growth:

- a) a "most likely" average rate of world economic growth of 3.3 per cent per annum (in real terms);
- b) moderate growth in world trade of about 4.0 per cent per annum;
- c) a "most likely" decline of 1.5 per cent per annum (in real terms) in average fares and rates for the world as a whole; and
- d) availability of adequate capital resources for the development of aviation and tourist infrastructure.

Results of the Econometric Analysis

25. Several econometric models were developed on the basis of historic data both for scheduled passenger travel demand and freight traffic demand for total world traffic and for major geographical regions. Appendix 18 depicts the econometric models developed for total world scheduled revenue passenger-kilometres (RPKs) and total world freight tonne-kilometres respectively. The first provided estimates of the effect on scheduled passenger travel of changes in world GDP and average passenger fare levels (both in real terms), and the second model provided estimates of the effect on scheduled freight transport of changes in world exports and average freight rate levels (in real terms).

26. Applying the above assumptions for the future to these models resulted in future growth rates for world scheduled traffic (excluding USSR) of 7.7 per cent per annum and 7.9 per cent per annum for passenger-kilometres and freight tonne-kilometres, respectively. Most of this growth in traffic is attributable to growth in real GDP and exports, and impact of fares and rates for the forecast period.

Passenger Traffic Forecasts

27. The above analysis of quantifiable economic factors, and the consideration of further factors which influence developments at global or regional levels, led to a forecast growth rate for world scheduled passenger traffic during the 1985 to 1995 period of about 7.0 per cent per annum, somewhat below the rate obtained from the econometric analysis. This growth rate is considered to be the "most likely" and compares with a historic growth rate of 7.0 per cent per annum over the 1975 to 1985 period.

28. As in the past, year-to-year growth is likely to fluctuate considerably. As an indication of the sensitivity of traffic growth to alternative assumptions about economic growth and trends in unit costs, a "low" forecast of 5.0 per cent per annum results from assumptions of 2.3 per cent per annum for real economic growth and no change in real fares. A "high" forecast of 9.0 per cent per annum results from assumptions of 4.5 per cent per annum for economic growth and an average annual decline in real fares of 2.5 per cent.

29. International scheduled passenger traffic is forecast to grow at an average rate of 8.0 per cent per annum compared with 6.0 per cent per annum for domestic scheduled passenger traffic (Table 5-3). The slower growth of domestic traffic is due to the fact that 77.0 per cent of all domestic scheduled traffic is accounted for by the already highly developed domestic systems in the USA and USSR where future growth rates are expected to be moderate.

Table 5-3

SUMMARY OF ICAO SCHEDULED PASSENGER TRAFFIC FORECAST FOR 1995
(ICAO Contracting States)

	Actual		Forecast	Average Annual Growth	
	1975	1985 ^{1/}	1995	1975-1985	1985-1995 ^{2/}
	(Thousand million)			(Per cent)	
Passenger-kilometres					
Scheduled services	697	1 360	2 680	6.9	7.0
International	270	594	1 310	8.2	8.0
Domestic	427	766	1 370	6.0	6.0
	(Million)			(Per cent)	
Passengers carried					
Scheduled services	534	891	1 500	5.3	5.5
International	108	189	355	5.8	6.5
Domestic	426	702	1 145	5.1	5.0

^{1/} Preliminary.

^{2/} Rounded to the nearest 0.5 percentage point.

30. Forecasts of scheduled passenger traffic in terms of numbers of passengers carried are also given in Table 5-3. Growth in passengers carried is expected to be lower than growth in passenger-kilometres because the latter includes the effect of a gradual increase in the average passenger journey distance at an annual rate of approximately 1.5 per cent. The increase in average journey length during the last decade has been more pronounced for domestic trips than for international trips.

31. The "most likely" forecasts of scheduled airline passenger traffic by region of airline registration are given in Table 5-4, together with historic figures. The African, Asia/Pacific, Middle Eastern, and Latin America and Caribbean regions are expected to experience annual growth in passenger traffic of 7.5 to 10.0 per cent, significantly above the world average. These regions contain a predominance of developing countries and are generally expected to have relatively high economic growths (around 5% p.a.). On the other hand, lower passenger traffic growth rates of 5.5 to 6.5 per cent per annum are forecast for the developed regions of Europe and North America where economic growth is expected to be lower (around 3% p.a.). Although traffic growth is expected to be relatively high in the developing regions, the forecasts imply a moderate slow-down in comparison with historic rates, particularly for the Middle East region.

Table 5-4

FORECASTS OF SCHEDULED PASSENGER TRAFFIC BY REGION
(Region of Airline Registration, ICAO Contracting States)

Region	Passenger-kilometres (Thousand-million)			Average Annual Growth Rate (Per cent)		Regional Share of World Traffic (Per cent)		
	Actual		Forecast	1975 to 1985	1985 to 1995 ^{2/}	1975	1985	1995
	1975	1985 ^{1/}	1995					
<u>AFRICA</u>	17.7	37.2	75	7.7	7.5	2.5	2.7	2.8
International	13.9	29.1	60	7.7	7.5	5.1	4.9	4.6
Domestic	4.0	8.1	15	7.3	7.0	0.9	1.1	1.1
<u>ASIA/PACIFIC</u>	86.5	221.3	575	9.8	10.0	12.4	16.3	21.5
International	51.2	150.3	430	11.4	11.0	18.9	25.3	32.8
Domestic	35.4	71.0	145	7.2	7.5	8.3	9.3	10.6
<u>EUROPE</u>	258.5	426.3	725	5.1	5.5	37.1	31.3	27.0
International	120.7	213.6	380	5.9	6.0	44.7	36.0	29.0
Domestic	137.8	212.7	345	4.4	5.0	32.3	27.7	25.2
<u>MIDDLE EAST</u>	12.7	43.0	105	13.0	9.5	1.8	3.2	3.9
International	10.7	35.0	85	12.6	9.0	4.0	5.9	6.5
Domestic	2.0	8.0	20	14.9	10.0	0.5	1.0	1.5
<u>NORTH AMERICA</u>	287.0	563.3	1 071	7.0	6.5	41.2	41.4	39.6
International	54.5	128.9	291	9.0	8.0	20.2	21.7	21.4
Domestic	232.5	434.4	780	6.5	6.0	54.4	56.7	56.9
<u>LATIN AMERICA AND CARIBBEAN</u>	34.8	69.0	140	7.1	7.5	5.0	5.1	5.2
International	19.3	36.8	75	6.7	7.0	7.1	6.2	5.7
Domestic	15.4	32.2	65	7.7	7.5	3.6	4.2	4.7
<u>WORLD</u>	697.4	1 360.1	2 680	6.9	7.0	100.0	100.0	100.0
International	270.3	593.7	1 310	8.2	8.0	100.0	100.0	100.0
Domestic	427.1	766.4	1 370	6.0	6.0	100.0	100.0	100.0

^{1/} Preliminary.

^{2/} Rounded to the nearest 0.5 percentage point.

32. The most significant changes in the regional shares of world scheduled passenger traffic (shown in Table 5-4) are expected for airlines of the Europe and Asia/Pacific regions. The European share is anticipated to decline by over 4 percentage points to 27.0 per cent of total world traffic by 1995, while the Asia/Pacific region is expected to increase its share of traffic by over 5 percentage points to 22.0 per cent by 1995 (with its share of total international scheduled passenger traffic increasing to approximately 33.0 per cent by 1995).

33. Non-scheduled passenger traffic, flown by both scheduled airlines and non-scheduled carriers, occurs mainly in Europe and on the North Atlantic. In recent years this traffic has fluctuated under the influence of general economic factors and competitive pressures from scheduled operations. During this period, European non-scheduled traffic increased its share from 40.0 to 43.0 per cent, whereas the North Atlantic share of non-scheduled traffic decreased from 26.0 per cent to 10.0 per cent (passengers carried). In view of various uncertainties the future growth of non-scheduled traffic is extremely uncertain and to a large degree depends upon national policies, regulatory environment, special events and other related factors. The dominance of scheduled services is likely to continue during the forecast period.

Freight Traffic Forecasts

34. The econometric analysis, together with the assumptions stated earlier, resulted in a projected future growth rate of 7.9 per cent per annum for world scheduled freight tonne-kilometres (excluding USSR traffic). Taking into consideration various factors not included in the econometric analysis, a growth in total world scheduled freight traffic of 7.5 per cent per annum is considered as the "most likely" forecast for the 1985 to 1995 period. This is similar to the past rate of growth for the 1975 to 1985 period. Alternative assumptions concerning the underlying factors affecting air freight suggest a band of forecast growth rates ranging from a "low" of 5.5 per cent per annum to a "high" of 9.5 per cent.

35. The ICAO forecasts of scheduled freight traffic, in terms of both tonne-kilometres performed and tonnes uplifted or carried, are presented in Table 5-5, including forecasts for the international and domestic components. International traffic is expected to grow more rapidly than domestic traffic due partly to the relatively fast growth of international commerce. Domestic freight is dominated by the more mature markets of the USA and USSR and this is another reason for the moderate growth of total domestic freight. Freight tonnes carried is expected to grow more slowly than freight tonne-kilometres because of a continuing increase in the average length of haul.

Table 5-5

SUMMARY OF ICAO SCHEDULED FREIGHT TRAFFIC FORECAST FOR 1995
(ICAO Contracting States)

	Actual		Forecast	Average Annual Growth	
	1975	1985 ^{1/}	1995	1975-1985	1985-1995 ^{2/}
	(Million)			(Per cent)	
<u>Freight tonne-kilometres</u>					
Scheduled services	19 371	39 340	82 600	7.3	7.5
International	11 632	28 930	67 485	9.5	9.0
Domestic	7 739	10 410	15 115	3.0	4.0
	(Thousand)			(Per cent)	
<u>Freight tonnes carried</u>					
Scheduled services	8 680	13 199	21 320	4.3	5.0
International	2 770	5 756	11 320	7.6	7.0
Domestic	5 910	7 443	10 000	2.3	3.0

^{1/} Preliminary.

^{2/} Rounded to the nearest 0.5 percentage point.

36. The "most likely" forecasts of scheduled freight traffic by region of airline registration are presented in Table 5-6. The regional pattern of growth is rather similar to that for passenger traffic. Asia/Pacific is expected to remain the fastest growing region although its forecast rate is somewhat lower from the growth rate of the past decade. By 1995, freight traffic by its airlines is expected to surpass both that for North America and for Europe. The economic recovery and liberalized service patterns, including door-to-door service and growing express parcel market, are expected to stimulate accelerated growth of the North American freight market.

Table 5-6

FORECASTS OF SCHEDULED FREIGHT TRAFFIC BY REGION
(Region of Airline Registration, ICAO Contracting States)

Region	Freight Tonne-kilometres (Million)			Average Annual Growth Rate (Per cent)		Regional Share of World Traffic (Per cent)		
	Actual		Forecast 1995	1975 to 1985	1985 to 1995 ^{2/}	1975	1985	1995
	1975	1985 ^{1/}						
<u>AFRICA</u>	474	1 080	2 130	8.6	7.0	2.4	2.7	2.6
International	407	990	2 000	9.3	7.5	3.5	3.4	3.0
Domestic	67	90	130	3.0	4.0	0.9	0.9	0.9
<u>ASIA/PACIFIC</u>	2 491	9 370	30 525	14.2	12.5	12.9	23.8	36.9
International	2 117	8 380	28 335	14.7	13.0	18.2	29.0	42.0
Domestic	374	990	2 140	10.2	8.0	4.8	9.5	14.1
<u>EUROPE</u>	7 122	14 430	27 210	7.3	6.5	36.8	36.7	32.9
International	4 928	11 610	23 480	8.9	7.5	42.3	40.1	34.8
Domestic	2 194	2 820	3 730	2.5	3.0	28.4	27.1	24.7
<u>MIDDLE EAST</u>	757	1 910	3 755	9.7	7.0	3.9	4.9	4.5
International	743	1 820	3 515	9.4	7.0	6.4	6.3	5.2
Domestic	14	90	240	20.5	11.0	0.2	0.9	1.6
<u>NORTH AMERICA</u>	7 536	10 440	15 075	3.3	4.0	38.9	26.5	18.3
International	2 721	4 650	7 430	5.5	5.0	23.4	16.1	11.0
Domestic	4 815	5 790	7 645	1.9	3.0	62.2	55.6	50.6
<u>LATIN AMERICA AND CARIBBEAN</u>	990	2 110	3 955	7.9	6.5	5.1	5.4	4.8
International	720	1 480	2 725	7.5	6.5	6.2	5.1	4.0
Domestic	270	630	1 230	8.8	7.0	3.5	6.0	8.1
<u>WORLD</u>	19 370	39 340	82 600	7.3	7.5	100.0	100.0	100.0
International	11 636	28 930	67 485	9.5	9.0	100.0	100.0	100.0
Domestic	7 734	10 410	15 115	3.0	4.0	100.0	100.0	100.0

^{1/} Preliminary.

^{2/} Rounded to the nearest 0.5 percentage point.

37. On the basis of the limited data available, non-scheduled freight traffic appears to have fluctuated considerably in the past. As for non-scheduled passenger traffic, it is extremely uncertain and difficult to forecast this traffic element.

Appendix 1

TOTAL COMMERCIAL TRANSPORT FLEET DISTINGUISHED BY TYPE OF PROPULSION: 1975-1985¹
 (ICAO Contracting States)²

YEAR	TURBO-JET AIRCRAFT									
	SST	WIDE-BODY JETS				NARROW-BODY JETS				TOTAL JETS
		4-engine	3-engine	2-engine	Total	4-engine	3-engine	2-engine	Total	
1975	-	254	324	14	592	1 465	1 239	1 849	4 553	5 145
1976	8	285	359	27	671	1 425	1 298	1 941	4 664	5 343
1977	10	305	388	40	733	1 388	1 375	2 010	4 773	5 516
1978	11	330	411	59	800	1 371	1 458	2 055	4 884	5 695
1979	12	386	462	84	932	1 239	1 629	2 131	4 999	5 943
1980	14	456	523	120	1 099	1 140	1 765	2 224	5 129	6 242
1981	14	487	560	153	1 200	1 009	1 781	2 351	5 141	6 355
1982	14	517	576	221	1 314	961	1 817	2 490	5 268	6 596
1983	14	538	565	301	1 404	837	1 826	2 651	5 314	6 732
1984	14	545	561	381	1 487	788	1 808	2 721	5 317	6 818
1985 ³	14	567	561	444	1 572	746	1 806	2 932	5 484	7 070

YEAR	TURBO-PROP AIRCRAFT			PISTON-ENGINE AIRCRAFT			TOTAL AIRCRAFT IN SERVICE
	4-engine	2-engine	Total	4-engine	2-engine	Total	
1975	485	1 027	1 512	402	1 054	1 456	8 113
1976	475	1 030	1 505	379	1 019	1 398	8 246
1977	465	1 010	1 475	357	991	1 348	8 339
1978	441	975	1 416	328	941	1 269	8 380
1979	410	994	1 404	278	835	1 113	8 460
1980	397	1 057	1 454	237	767	1 004	8 700
1981	418	1 052	1 470	213	732	945	8 770
1982	416	1 069	1 485	199	706	906	8 987
1983	407	1 106	1 513	186	690	878	9 123
1984	387	1 153	1 540	162	645	809	9 167
1985 ³	380	1 220	1 600	140	590	730	9 400

- Notes:
1. International and domestic scheduled and non-scheduled, fixed-wing aircraft of over 9 000 kg. maximum take-off weight.
 2. Excluding China and the USSR.
 3. 1985 data are preliminary.

Source: ATR Form H and various aviation reports.

Appendix 2

TOTAL COMMERCIAL TRANSPORT FLEET: 1975-1985
(ICAO Contracting States; as at December 31 of each year)¹

Year	Region ² → Category ³ →	Africa (51)		Asia and Pacific (29)		Europe (28)		Latin America & Caribbean (30)		Middle East (14)		North America (2)		World Total (154)	
		Jets	Total	Jets	Total	Jets	Total	Jets	Total	Jets	Total	Jets	Total	Jets	Total
1975		215	490	450	980	1 470	2 095	343	1 050	160	220	2 507	3 278	5 145	8 113
1976		240	510	518	1 056	1 510	2 070	360	1 070	190	260	2 525	3 280	5 343	8 246
1977		246	549	550	1 070	1 570	2 090	390	1 070	200	270	2 560	3 290	5 516	8 339
1978		250	570	620	1 120	1 610	2 100	430	1 040	230	290	2 555	3 260	5 695	8 380
1979		250	563	640	1 123	1 637	2 050	430	1 028	236	286	2 750	3 410	5 943	8 460
1980		285	530	659	1 100	1 735	2 120	479	1 030	245	290	2 839	3 630	6 242	8 700
1981		298	542	694	1 145	1 750	2 135	520	1 065	250	303	2 843	3 580	6 355	8 770
1982		337	563	705	1 146	1 725	2 135	573	1 047	287	313	2 969	3 783	6 596	8 987
1983		355	573	710	1 130	1 702	2 137	583	1 035	295	315	3 087	3 933	6 732	9 123
1984		384	590	720	1 128	1 657	2 140	560	951	305	335	3 192	4 023	6 818	9 167
1985 ⁴		400	600	740	1 130	1 670	2 140	560	950	320	340	3 380	4 240	7 070	9 400

B: Distribution of Jet Aircraft by Category

Category ³	Year →	Africa (51)			Asia and Pacific (29)			Europe (28)			Latin America & Caribbean (30)			Middle East (14)			North America (2)			World Total (154)		
		1975	1980	1985	1975	1980	1985	1975	1980	1985	1975	1980	1985	1975	1980	1985	1975	1980	1985	1975	1980	1985
SST		-	-	-	-	-	-	-	14	14	-	-	-	-	-	-	-	-	-	-	14	14
Wide-bodied		10	31	62	85	234	345	145	280	250	9	36	65	21	66	120	322	452	630	592	1 099	1 572
Narrow-bodied		205	254	338	365	425	395	1 325	1 441	1 306	334	443	495	139	179	200	2 185	2 387	2 750	4 553	5 129	5 484
TOTAL JETS		215	285	400	450	659	740	1 470	1 735	1 670	343	479	560	160	245	320	2 507	2 839	3 380	5 145	6 242	7 070

- Notes:**
1. Excluding China and the USSR.
 2. Numbers within parentheses indicate number of countries in each region.
 3. Fixed-wing aircraft of over 9 000 kg. maximum take-off weight.
 4. 1985 data are preliminary.

Source: ATR Forms H and various aviation reports.

Appendix 3

AIRCRAFT DISTRIBUTION BETWEEN SCHEDULED AND NON-SCHEDULED AIR CARRIERS: 1975-1985
(ICAO Contracting States; as at December 31 of each year)¹

End of Year	JET AIRCRAFT ²								ALL AIRCRAFT ²						
	Scheduled Airlines				Non-Scheduled Operators				TOTAL JETS	Scheduled Airlines		Non-Scheduled Operators		All Operators	
	SST	Wide-Body	Narrow-Body	Total	Wide-Body	Narrow-Body	Total	Number		% Jet	Number	% Jet	Number	% Jet	
1975	-	572	4 179	4 751	20	374	394	5 145	6 940	68	1 173	34	8 113	63	
1976	8	650	4 264	4 922	21	400	421	5 343	7 033	70	1 213	35	8 246	65	
1977	10	711	4 370	5 091	22	403	425	5 516	7 109	72	1 230	35	8 339	66	
1978	11	773	4 470	5 254	27	414	441	5 695	7 147	74	1 233	36	8 380	68	
1979	12	892	4 590	5 494	40	409	449	5 943	7 330	75	1 130	40	8 460	70	
1980	14	1 068	4 681	5 763	31	448	479	6 242	7 577	76	1 123	43	8 700	72	
1981	14	1 165	4 748	5 927	35	393	428	6 355	7 727	77	1 043	39	8 770	72	
1982	14	1 272	4 787	6 073	42	481	523	6 596	7 851	77	1 136	46	8 987	73	
1983	14	1 359	4 774	6 147	45	540	585	6 732	7 891	78	1 232	47	9 123	74	
1984	14	1 430	4 772	6 216	57	545	602	6 818	7 947	78	1 220	49	9 167	74	
1985 ³	14	1 512	4 881	6 407	60	603	663	7 070	8 140	79	1 260	53	9 400	75	

- Notes:
1. Excluding China and the USSR.
 2. Fixed-wing aircraft of over 9 000 kg. maximum take-off weight.
 3. 1985 data are preliminary.

Source: ATR Forms D-1, D-2, AD-3, H; and various aviation reports.

Appendix 4

AIRCRAFT OF SCHEDULED AIRLINES: 1975-1985
(ICAO Contracting States; as at December 31 of each year)¹

AIRCRAFT TYPE ² (Listed alphabetically according to number of engines)	Year of first entry into service	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ³
TURBO JETS												
SST Aircraft												
Aerospatiale/BAC-Concorde	1976	-	8	10	11	12	14	14	14	14	14	14
Wide-Bodied Aircraft												
Airbus A300 (2-engined)	1974	8	21	37	52	76	112	153	190	205	222	236
Airbus A310 (2-engined)	1983	-	-	-	-	-	-	-	-	17	41	68
Boeing 747 (4-engined)	1969	243	275	295	322	376	437	480	512	532	538	560
Boeing 767 (2-engined)	1982	-	-	-	-	-	-	-	20	66	98	120
Douglas DC-10 (3-engined)	1971	206	220	234	248	280	326	331	337	327	323	320
Lockheed L-1011 (3-engined)	1972	115	134	145	151	160	193	201	213	212	208	208
Total Wide-Bodied		572	650	711	773	892	1 068	1 165	1 272	1 359	1 430	1 512
Narrow-Bodied Turbo-Jets												
BAC 146	1983	-	-	-	-	-	-	-	-	7	16	32
Boeing 707 (All Series)	1958	615	590	575	564	515	493	430	375	300	260	220
Boeing 720, B	1960	104	102	100	95	90	77	50	47	42	34	24
Douglas DC-8 (All Series)	1959	485	465	445	413	392	335	310	295	264	245	230
Ilyushin IL-62	1968	15	17	20	28	30	32	39	37	40	42	42
Ilyushin IL-76	1977	-	-	-	4	4	11	16	25	26	35	35
Miscellaneous		102	96	93	77	59	50	18	18	16	15	15
Total (4-Engined)		1 321	1 270	1 233	1 181	1 090	998	863	797	695	647	598
(3-Engined)												
BAC Hawker HS-121 Trident	1963	64	62	61	60	55	53	53	52	31	26	19
Boeing 727	1963	1 075	1 150	1 230	1 336	1 451	1 550	1 600	1 595	1 576	1 560	1 550
Tupolev TU-154	1971	13	13	19	25	26	35	41	44	47	48	48
Yakovlev YAK-40/42	1969	18	18	26	40	42	43	51	52	55	56	56
Total (3-Engined)		1 170	1 243	1 336	1 461	1 574	1 681	1 745	1 743	1 709	1 690	1 673
(2-Engined)												
BAC One-Eleven	1965	160	160	154	150	150	143	140	140	140	138	138
BAC Hawker HS-125	1964	30	30	32	33	35	35	36	36	36	35	35
Boeing 737	1967	390	427	445	465	525	610	694	770	820	880	970
Boeing 757	1982	-	-	-	-	-	-	-	2	26	41	76
Dassault-Mystère 20/Falcon	1965	60	60	65	70	70	70	72	72	70	55	50
Douglas DC-9//MD-80	1965	720	750	775	794	830	840	896	928	970	990	1 050
Fokker F-28 Fellowship	1969	57	67	85	90	95	103	113	120	132	140	150
Marcel Dassault Mercure	1974	10	10	10	10	10	10	10	10	10	10	10
Sud Aviation SE-210	1959	200	180	160	140	130	105	90	82	80	60	40
Tupolev TU-134	1967	40	41	44	47	52	62	65	65	66	66	66
Miscellaneous		21	26	31	29	29	24	24	22	20	20	25
Total (2-Engined)		1 688	1 751	1 801	1 828	1 926	2 002	2 140	2 247	2 370	2 435	2 610
TOTAL TURBO-JETS		4 751	4 922	5 091	5 254	5 494	5 763	5 927	6 073	6 147	6 216	6 407

Appendix 4 (Cont'd)

AIRCRAFT OF SCHEDULED AIRLINES: 1975-1985
(ICAO Contracting States; as at December 31 of each year)¹

AIRCRAFT TYPE ² (Listed alphabetically according to number of engines)	Year of first entry into service	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ³
		TURBO-PROPS										
BAC (Vickers) 700 Viscount	1953	95	80	65	54	50	35	30	26	25	22	20
BAC (Vickers) 800 Viscount	1957	57	56	55	45	45	40	38	32	30	28	26
BAC (Vickers) 950 Vanguard	1960	23	22	22	20	20	17	15	12	12	10	8
De Havilland DHC-7 Dash	1978	-	-	-	2	8	24	40	58	59	60	66
Ilyushin IL-18	1959	43	43	43	42	42	47	48	49	49	46	45
Lockheed L-188 Electra	1958	75	72	65	58	56	52	50	45	42	42	40
Lockheed L-100/380 Hercules	1965	23	25	30	31	32	32	32	32	33	33	34
Miscellaneous		52	48	44	42	40	39	39	39	35	32	30
Total (4-Engined)		368	346	324	294	293	286	292	293	285	273	269
Piston-Engined												
Aerospatiale N-262	1963	32	30	30	26	22	22	20	20	18	15	15
Aerospatiale/Aeritalia ATR-42	1985	-	-	-	-	-	-	-	-	-	-	2
Antonov AN-24/26/30	1963	44	45	45	50	55	75	95	114	119	126	130
BAC (Handley Page) Herald	1961	34	34	34	31	31	31	30	30	27	24	15
BAC (Bawker) HS-748	1962	120	115	110	105	100	100	100	95	95	100	100
Convair CV-340/440 Turbo	1971	16	50	55	55	60	70	70	70	65	65	60
Convair CV-540/580/600/640	1959	113	65	60	50	45	45	40	40	38	35	35
De Havilland DHC-8	1984	-	-	-	-	-	-	-	-	-	-	16
Embraer EMB-120	1985	-	-	-	-	-	-	-	-	-	-	6
Fokker/Fairchild F-27/FN-227	1958	445	440	435	424	405	380	376	370	370	372	375
HANCO YB-11	1965	120	115	110	105	100	100	95	90	85	78	70
Saab SF-340	1984	-	-	-	-	-	-	-	-	-	10	35
Shorte 330	1976	-	3	6	10	22	35	48	62	62	65	65
Shorte 360	1982	-	-	-	-	-	-	-	2	25	32	40
Miscellaneous		25	25	24	24	24	23	23	22	22	20	20
Total (2-Engined)		949	922	909	880	864	881	902	915	928	947	984
TOTAL TURBO-PROPS		1 317	1 268	1 233	1 174	1 157	1 167	1 194	1 208	1 213	1 220	1 253
Piston-Engined												
Douglas DC-4/C-54	1939	75	70	65	55	50	45	35	30	25	25	25
Douglas DC-6, A, B	1947	90	88	85	80	79	75	70	65	62	60	55
Miscellaneous		86	85	77	68	61	51	43	35	35	32	30
Total (4-Engined)		251	243	227	203	190	171	148	130	122	117	110
Piston-Engined												
Convair CV-340/440	1952	65	60	50	42	38	35	35	34	30	30	25
Curtiss C-46 Commando	1941	65	65	55	53	50	50	47	47	40	40	35
Douglas DC-3/C-47	1936	360	350	335	315	305	299	290	281	270	262	250
Ilyushin IL-14	1954	37	35	34	30	25	22	20	15	12	10	10
Martin 202/A04	1947	21	20	20	17	15	15	15	15	12	10	10
Miscellaneous		73	70	64	59	56	55	51	48	45	42	40
Total (2-Engined)		621	600	558	516	489	476	458	440	409	394	370
TOTAL PISTON-ENGINE		872	843	785	719	679	647	606	570	531	511	480
TOTAL ALL TYPES		6 940	7 033	7 109	7 147	7 330	7 577	7 727	7 851	7 891	7 947	8 140

- Notes:**
1. Excluding China and the USSR.
 2. Fixed-wing aircraft of over 9 000 kg. maximum take-off weight.
 3. 1985 data are preliminary.

Sources: ATR Forms D-1, D-2, AD-3 and H; aircraft manufacturer's and other reports.

Appendix 5

FLEET, PERSONNEL AND PRODUCTIVITY DATA FOR THE INTERNATIONAL SCHEDULED AIRLINES: 1975-1985
(ICAO Contracting States)¹

Items	Years										
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ²
1. Number of airlines	216	223	212	215	234	225	218	214	223	239	251
2. Number of aircraft in fleet	5 770	5 860	5 970	6 130	6 290	6 460	6 530	6 600	6 630	6 690	6 850
3. Number of aircraft over 9 tonnes maximum take-off weight	5 270	5 390	5 530	5 680	5 850	6 030	6 150	6 260	6 290	6 360	6 600
4. Large aircraft as % of total fleet	91.3	92.0	92.6	92.7	93.0	93.3	94.2	94.8	94.9	95.1	96.4
5. Number of flight crew ³	87 500	90 000	95 000	96 500	99 700	102 500	103 000	103 000	103 500	104 500	106 500
6. Number of flight crew per aircraft	15	15	16	16	16	16	16	16	16	16	16
7. Total number of employees (including flight crew personnel)	885 000	915 000	930 000	953 500	960 000	980 000	980 000	982 000	985 000	989 000	992 000
8. Employees per aircraft	153	156	156	156	153	152	150	149	149	148	145
9. Aircraft hours flown ('000)	11 542	12 077	12 500	13 032	13 988	14 076	13 578	13 348	13 685	14 310	15 000
10. Average hours flown per aircraft ('000)	2 064	2 061	2 094	2 126	2 224	2 179	2 079	2 022	2 064	2 139	2 190
11. Tonne-kilometres available (TKA-millions)	139 113	151 268	163 961	173 988	192 044	204 366	206 442	208 473	214 066	227 400	241 000
12. TKA per aircraft ('000)	24 110	25 814	27 464	28 383	30 532	31 636	31 614	31 587	32 287	33 991	35 182
13. TKA per employee ('000)	157	165	176	182	200	209	211	212	217	230	243

Notes: 1. Excluding China and the USSR.
2. 1985 data are preliminary.
3. Excluding cabin attendants.

Appendix 6

INDICATORS OF THE CHANGING STRUCTURE OF SCHEDULED AIR TRAFFIC: 1975-1985

(ICAO Contracting States)¹

Year	Averages per Aircraft											
	Stage distance			Average Speed			Payload capacity			Weight load factor		
	Total	Int'l	Domestic	Total	Int'l	Domestic	Total	Int'l	Domestic	Total	Int'l	Domestic
	km.			km/hr			tonnes			tonnes		
1975	776	1 472	598	597	661	563	18.8	24.2	15.5	50	52	49
1976	785	1 492	603	602	662	569	19.4	25.3	15.7	54	54	50
1977	799	1 511	616	606	664	574	20.1	26.6	16.0	53	55	51
1978	819	1 542	629	608	666	575	20.5	27.3	16.1	56	58	55
1979	858	1 586	666	614	668	585	21.1	28.7	16.3	57	59	56
1980	874	1 608	679	619	673	589	22.0	30.4	16.6	55	57	53
1981	889	1 636	686	618	674	586	23.0	32.0	17.2	56	59	52
1982	885	1 641	684	618	675	587	23.5	33.1	17.4	56	58	53
1983	871	1 628	676	612	673	579	23.7	33.6	17.5	57	60	54
1984	888	1 683	692	613	675	581	24.0	34.7	17.6	58	62	53
1985 ²	936	1 687	748	637	675	618	23.3	35.4	16.5	58	61	54

Notes: 1. Excluding the USSR.
2. 1985 data are preliminary.

DEVELOPMENT OF WORLD SCHEDULED REVENUE TRAFFIC - TOTAL OF INTERNATIONAL AND DOMESTIC OPERATIONS: 1975-1985¹
 (Scheduled Airlines of ICAO Contracting States)

Appendix 7

Year	International		Domestic		Total		Passenger load factor	Weighted load factor
	Passengers carried	Revenue tonne-kilometers performed	Passengers carried	Revenue tonne-kilometers performed	Passengers carried	Revenue tonne-kilometers performed		
1975	7 250	12.6	9.7	10.0	17.3	10.0	162 410	50
1976	7 460	10.0	4.75	10.0	12.75	10.0	152 070	52
1977	8 090	10.1	13.3	10.0	13.4	10.1	162 410	53
1978	8 500	10.4	14.9	10.0	15.3	10.4	172 210	54
1979	9 150	10.7	16.9	10.0	17.6	10.7	182 640	55
1980	9 550	10.7	15.1	10.0	17.8	10.7	192 640	56
1981	9 110	10.2	14.7	10.0	17.4	10.2	209 760	57
1982	9 120	10.3	14.8	10.0	17.5	10.3	209 760	58
1983	9 350	10.7	15.3	10.0	18.0	10.7	221 610	59
1984	9 990	11.2	16.3	10.0	19.5	11.2	229 910	58
1985	10 870	11.6	17.0	10.0	21.6	11.6	253 130	58
Include USSR								
1975	534	697 000	1 179 000	1 179 000	1 179 000	62 520	19 370	2 900
1976	576	764 000	1 270 000	1 270 000	1 270 000	68 690	21 540	3 030
1977	610	818 000	1 346 000	1 346 000	1 346 000	73 630	23 620	3 180
1978	679	926 000	1 491 000	1 491 000	1 491 000	79 170	25 870	3 270
1979	748	1 060 000	1 607 000	1 607 000	1 607 000	83 420	28 010	3 430
1980	768	1 089 000	1 724 000	1 724 000	1 724 000	87 920	29 380	3 600
1981	752	1 119 000	1 756 000	1 756 000	1 756 000	90 810	30 860	3 800
1982	764	1 142 000	1 793 000	1 793 000	1 793 000	93 700	32 340	3 970
1983	795	1 187 000	1 847 000	1 847 000	1 847 000	96 590	33 820	4 140
1984	841	1 221 000	1 926 000	1 926 000	1 926 000	99 480	35 300	4 310
1985	897	1 260 000	2 025 000	2 025 000	2 025 000	102 370	36 780	4 480
Exclude USSR								
1975	2 900	2.9	4.4	2.9	4.4	11 640	1 210	37 340
1976	3 030	2.1	4.6	2.9	4.6	12 220	1 260	38 470
1977	3 130	2.1	4.7	2.9	4.7	12 800	1 310	39 600
1978	3 230	2.2	5.0	2.9	5.0	13 380	1 360	40 730
1979	3 330	2.2	5.3	2.9	5.3	13 960	1 410	41 860
1980	3 430	2.2	5.3	2.9	5.3	14 540	1 460	42 990
1981	3 530	2.2	5.4	2.9	5.4	15 120	1 510	44 120
1982	3 630	2.2	5.4	2.9	5.4	15 700	1 560	45 250
1983	3 730	2.3	5.7	2.9	5.7	16 280	1 610	46 380
1984	3 830	2.3	5.7	2.9	5.7	16 860	1 660	47 510
1985	4 030	2.4	5.9	2.9	5.9	17 440	1 710	48 640
Exclude USSR								
1975	4 620	4.20	6.2	4.20	6.2	27 610	5.70	71 390
1976	4 790	4.20	6.6	4.20	6.6	28 190	5.70	72 520
1977	4 960	4.0	6.6	4.20	6.6	28 770	5.70	73 650
1978	5 130	4.6	6.7	4.20	6.7	29 350	5.70	74 780
1979	5 230	4.6	6.8	4.20	6.8	29 930	5.70	75 910
1980	5 330	4.7	6.8	4.20	6.8	30 510	5.70	77 040
1981	5 430	4.7	6.8	4.20	6.8	31 090	5.70	78 170
1982	5 530	4.7	6.8	4.20	6.8	31 670	5.70	79 300
1983	5 630	4.7	6.8	4.20	6.8	32 250	5.70	80 430
1984	5 730	4.7	6.8	4.20	6.8	32 830	5.70	81 560
1985	5 930	4.7	6.8	4.20	6.8	33 410	5.70	82 690
Exclude USSR								
1975	6 220	6.20	8.2	6.20	8.2	38 020	7.20	96 720
1976	6 390	6.20	8.2	6.20	8.2	38 600	7.20	97 850
1977	6 560	6.20	8.2	6.20	8.2	39 180	7.20	98 980
1978	6 730	6.20	8.2	6.20	8.2	39 760	7.20	100 110
1979	6 830	6.20	8.2	6.20	8.2	40 340	7.20	101 240
1980	6 930	6.20	8.2	6.20	8.2	40 920	7.20	102 370
1981	7 030	6.20	8.2	6.20	8.2	41 500	7.20	103 500
1982	7 130	6.20	8.2	6.20	8.2	42 080	7.20	104 630
1983	7 230	6.20	8.2	6.20	8.2	42 660	7.20	105 760
1984	7 330	6.20	8.2	6.20	8.2	43 240	7.20	106 890
1985	7 530	6.20	8.2	6.20	8.2	43 820	7.20	108 020
Exclude USSR								
1975	6 960	6.20	10.8	6.20	10.8	42 000	9.50	116 690
1976	7 130	6.20	10.8	6.20	10.8	42 580	9.50	117 820
1977	7 300	6.20	10.8	6.20	10.8	43 160	9.50	118 950
1978	7 470	6.20	10.8	6.20	10.8	43 740	9.50	120 080
1979	7 640	6.20	10.8	6.20	10.8	44 320	9.50	121 210
1980	7 810	6.20	10.8	6.20	10.8	44 900	9.50	122 340
1981	7 980	6.20	10.8	6.20	10.8	45 480	9.50	123 470
1982	8 150	6.20	10.8	6.20	10.8	46 060	9.50	124 600
1983	8 320	6.20	10.8	6.20	10.8	46 640	9.50	125 730
1984	8 490	6.20	10.8	6.20	10.8	47 220	9.50	126 860
1985	8 660	6.20	10.8	6.20	10.8	47 800	9.50	127 990

NOTE: 1. Owing to rounding of figures, total tonne-kilometres performed do not always correspond exactly to the sum of the passenger, freight and mail traffic. All 1985 data are preliminary.

Appendix 8

SEASONAL VARIATIONS OF INTERNATIONAL SCHEDULED TRAFFIC: 1975-1985 (For 13 Major Airlines)¹

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Peak/ Trough Factor
PASSENGER-KILOMETRES PERFORMED (MILLIONS)														
1975	10 803	<u>9 158</u>	12 002	10 338	11 777	13 361	14 877	<u>16 236</u>	15 219	12 725	10 537	11 708	148 741	1.77
1976	11 727	<u>10 192</u>	12 193	12 214	13 282	14 745	16 480	<u>17 201</u>	16 488	13 576	11 411	12 575	162 091	1.69
1977	12 750	<u>10 675</u>	12 942	13 300	14 297	16 394	17 708	<u>18 249</u>	17 674	15 405	12 640	13 738	175 772	1.71
1978	13 873	<u>11 733</u>	14 566	14 803	16 531	18 653	21 580	<u>22 038</u>	20 465	17 385	14 611	15 976	202 234	1.88
1979	15 919	<u>13 450</u>	16 039	17 724	18 860	21 311	23 956	<u>25 044</u>	22 327	19 566	15 954	16 366	226 516	1.86
1980	16 786	<u>14 855</u>	17 952	17 364	18 829	20 876	23 540	<u>25 005</u>	21 483	19 077	16 414	16 675	228 856	1.68
1981	16 876	<u>14 842</u>	17 340	18 453	20 056	20 754	23 528	<u>25 133</u>	22 181	20 137	16 851	17 007	233 148	1.69
1982	17 502	<u>14 846</u>	17 778	18 764	19 803	21 091	23 761	<u>24 731</u>	21 930	20 302	15 802	16 676	232 986	1.67
1983	17 172	<u>14 302</u>	17 617	17 978	19 247	21 159	24 565	<u>25 108</u>	22 911	21 286	16 342	17 581	235 268	1.76
1984	17 846	<u>15 169</u>	18 272	19 810	21 431	23 550	25 550	<u>27 169</u>	25 173	22 076	18 098	19 122	253 266	1.79
1985	17 841	<u>16 192</u>	20 557	20 602	22 916	25 935	27 669	<u>28 776</u>	25 519	22 625	18 635	19 616	266 886	1.78
PERCENTAGE DISTRIBUTION ²														
1975	7.2	6.2	8.1	6.9	7.9	9.0	10.0	10.9	10.2	8.6	7.1	7.9	100	
1976	7.2	6.3	7.5	7.5	8.2	9.1	10.2	10.6	10.2	8.4	7.0	7.8	100	
1977	7.2	6.1	7.4	7.6	8.1	9.3	10.1	10.4	10.0	8.8	7.2	7.8	100	
1978	6.9	5.8	7.2	7.3	8.2	9.2	10.7	10.9	10.1	8.6	7.2	7.9	100	
1979	7.0	5.9	7.1	7.8	8.3	9.4	10.6	11.1	9.9	8.6	7.1	7.2	100	
1980	7.3	6.5	7.8	7.6	8.2	9.1	10.3	11.0	9.4	8.3	7.2	7.3	100	
1981	7.2	6.4	7.4	8.0	8.6	8.9	10.1	10.8	9.5	8.6	7.2	7.3	100	
1982	7.5	6.4	7.6	8.1	8.5	9.0	10.2	10.6	9.4	8.7	6.8	7.2	100	
1983	7.3	6.1	7.5	7.6	8.2	9.0	10.4	10.7	9.7	9.1	6.9	7.5	100	
1984	7.1	6.0	7.2	7.8	8.5	9.3	10.1	10.7	9.9	8.7	7.1	7.6	100	
1985	6.7	6.1	7.7	7.7	8.6	9.7	10.4	10.8	9.5	8.5	7.0	7.3	100	
PASSENGER LOAD FACTORS (PER CENT)														
1975	52.3	49.3	55.5	50.7	51.9	54.2	58.7	63.3	60.3	56.5	51.9	54.1	55.2	
1976	54.4	50.3	53.4	53.6	56.1	59.5	63.9	65.6	63.3	56.3	53.6	54.7	57.4	
1977	56.8	52.0	55.2	56.1	57.3	60.7	63.9	66.1	63.7	59.8	54.8	55.2	58.8	
1978	56.9	53.0	57.1	58.9	59.0	64.9	70.1	71.8	69.4	61.4	57.3	59.0	62.1	
1979	59.6	56.2	60.4	63.1	61.6	71.6	71.9	73.8	69.9	63.6	58.2	57.8	64.5	
1980	57.3	54.4	60.8	57.9	58.3	64.0	66.5	69.4	64.7	60.3	57.6	58.2	61.1	
1981	58.9	56.9	59.1	61.5	61.9	64.4	66.9	71.1	66.6	63.5	59.6	60.6	62.9	
1982	60.4	57.0	61.1	62.0	60.8	63.8	66.2	68.9	65.2	62.1	56.6	58.4	62.2	
1983	58.8	56.1	61.1	60.1	59.5	64.6	69.1	71.3	69.0	65.4	58.4	61.2	63.3	
1984	60.9	57.2	62.4	65.1	66.4	70.4	71.6	74.7	72.8	66.9	61.8	63.7	66.6	
1985	62.5	59.7	71.0	66.5	64.6	71.1	71.3	72.7	69.2	63.6	59.1	60.6	66.3	
FREIGHT TONNE-KILOMETRES PERFORMED (MILLIONS)														
1975	<u>442</u>	472	581	531	528	525	513	516	556	561	567	<u>592</u>	6 384	1.34
1976	<u>308</u>	556	650	597	607	584	587	549	609	629	623	<u>650</u>	7 149	1.28
1977	<u>339</u>	583	685	634	651	659	650	617	687	781	<u>784</u>	773	8 043	1.45
1978	<u>622</u>	661	757	715	734	753	762	736	773	<u>854</u>	804	803	8 974	1.37
1979	<u>688</u>	726	843	793	842	799	849	801	869	<u>913</u>	861	841	9 825	1.33
1980	<u>728</u>	797	897	831	837	824	844	805	826	<u>933</u>	892	874	10 088	1.28
1981	<u>751</u>	797	957	872	891	842	909	848	885	<u>992</u>	958	929	10 631	1.32
1982	<u>800</u>	851	965	876	920	863	897	839	873	<u>971</u>	941	958	10 754	1.21
1983	<u>792</u>	846	1 003	930	949	950	996	940	1 017	<u>1 143</u>	1 100	1 118	11 784	1.44
1984	<u>817</u>	894	1 191	1 114	1 106	1 101	1 160	1 097	1 161	<u>1 212</u>	1 204	1 177	13 241	1.49
1985	<u>989</u>	1 094	1 201	1 097	1 130	1 136	1 140	1 092	1 154	<u>1 322</u>	1 298	1 275	13 931	1.33
PERCENTAGE DISTRIBUTION ²														
1975	6.9	7.4	9.1	8.3	8.3	8.2	8.0	8.1	8.7	8.8	8.9	9.3	100	
1976	7.1	7.8	9.1	8.4	8.5	8.1	8.2	7.7	8.5	8.8	8.7	9.1	100	
1977	6.7	7.3	8.5	7.9	8.1	8.2	8.1	7.7	8.5	9.7	9.7	9.6	100	
1978	6.9	7.4	8.4	8.0	8.2	8.4	8.5	8.2	8.6	9.5	9.0	8.9	100	
1979	7.0	7.4	8.6	8.1	8.6	8.1	8.6	8.1	8.8	9.3	8.8	8.6	100	
1980	7.2	7.9	8.9	8.2	8.3	8.2	8.4	8.0	8.2	9.2	8.8	8.7	100	
1981	7.1	7.5	9.0	8.2	8.4	7.9	8.6	8.0	8.3	9.3	9.0	8.7	100	
1982	7.4	7.9	9.0	8.2	8.6	8.0	8.3	7.8	8.1	9.0	8.8	8.9	100	
1983	6.7	7.2	8.5	7.9	8.1	8.1	8.4	8.0	8.6	9.7	9.3	9.5	100	
1984	6.2	6.7	9.0	8.4	8.3	8.3	8.8	8.3	8.8	9.2	9.1	8.9	100	
1985	7.1	7.9	8.6	7.9	8.1	8.2	8.2	7.8	8.3	9.5	9.3	9.1	100	

Notes: 1. Airlines included: Air Canada, Air France, Alitalia, British Airways, Japan Air Lines, Iberia, KLM, Lufthansa, Pan Am, Qantas, SAS, Swissair, TWA.
2. The average month is 8.32.

Appendix 9A

INTERNATIONAL SCHEDULED TRAFFIC IN 1975 AND 1985
(By Region of Airline Registration)

	WORLD	EUROPE	AFRICA	MIDDLE EAST	ASIA & PACIFIC	NORTH AMERICA	LATIN AMERICA & CARIBBEAN
<u>PASSENGER-KMS (Millions)</u>							
1975	270 259	120 692	13 865	10 666	51 166	54 520	19 350
Distribution	100%	44.7%	5.1%	3.9%	18.9%	20.2%	7.2%
1985	593 700	213 600	29 100	35 000	150 300	128 900	36 800
Distribution	100%	36.0%	4.9%	5.9%	25.3%	21.7%	6.2%
Average Annual Growth	8.2%	5.9%	7.7%	12.6%	11.4%	9.0%	6.6%
<u>FREIGHT-TKM (Millions)</u>							
1975	11 636	4 928	407	743	2 117	2 721	720
Distribution	100%	42.3%	3.5%	6.4%	18.2%	23.4%	6.2%
1985	28 930	11 610	990	1 820	8 380	4 650	1 480
Distribution	100%	40.1%	3.4%	6.3%	29.0%	16.1%	5.1%
Average Annual Growth	9.5%	8.9%	9.3%	9.4%	14.7%	5.5%	7.5%
<u>MAIL-TKM (Millions)</u>							
1975	1 211	427	30	16	131	576	31
Distribution	100%	35.3%	2.5%	1.3%	10.8%	47.6%	2.5%
1985	1 840	720	50	50	280	690	50
Distribution	100%	39.2%	2.7%	2.7%	15.2%	37.5%	2.7%
Average Annual Growth	4.3%	5.4%	5.2%	12.1%	7.9%	1.8%	4.9%
<u>TOTAL TKP (Millions)</u>							
1975	37 343	16 234	1 684	1 725	6 978	8 244	2 478
Distribution	100%	43.5%	4.5%	4.6%	18.7%	22.1%	6.6%
1985	85 540	32 070	3 680	5 060	22 820	17 030	4 880
Distribution	100%	37.5%	4.3%	5.9%	26.7%	19.9%	5.7%
Average Annual Growth	8.6%	7.0%	8.1%	11.4%	12.6%	7.5%	7.0%
<u>WEIGHT LOAD FACTOR (Millions)</u>							
1975	52	54	51	53	56	47	52
1985	61	65	50	52	66	56	55

Appendix 9B

DOMESTIC SCHEDULED TRAFFIC IN 1975 AND 1985
(By Region of Airline Registration)

	WORLD	EUROPE	AFRICA	MIDDLE EAST	ASIA & PACIFIC	NORTH AMERICA	LATIN AMERICA & CARIBBEAN
<u>PASSENGER-KMS (Millions)</u>							
1975	427 101	137 843	3 998	2 010	35 358	232 493	15 399
Distribution	100%	32.3%	0.9%	0.5%	8.3%	54.4%	3.6%
1985	766 400	212 700	8 100	8 000	71 000	434 400	32 200
Distribution	100%	27.7%	1.1%	1.0%	9.3%	56.7%	4.2%
Average Annual Growth	6.0%	4.4%	7.3%	14.8%	7.2%	6.5%	7.7%
<u>FREIGHT-TKM (Millions)</u>							
1975	7 734	2 194	67	14	374	4 815	270
Distribution	100%	28.4%	0.9%	0.2%	4.8%	62.2%	3.5%
1985	10 410	2 820	90	90	990	5 790	630
Distribution	100%	27.1%	0.9%	0.9%	9.5%	55.6%	6.0%
Average Annual Growth	3.0%	2.5%	3.0%	20.5%	10.2%	1.9%	8.8%
<u>MAIL-TKM (Millions)</u>							
1975	1 690	492	6	2	46	1 136	8
Distribution	100%	29.1%	0.4%	0.1%	2.7%	67.2%	0.5%
1985	2 510	530	10	5	100	1 840	25
Distribution	100%	21.1%	0.4%	0.2%	4.0%	73.3%	1.0%
Average Annual Growth	4.0%	0.7%	5.2%	9.6%	8.0%	4.9%	12.1%
<u>TOTAL TKP (Millions)</u>							
1975	47 450	15 010	430	196	3 247	27 043	1 524
Distribution	100%	31.6%	0.9%	0.4%	6.9%	57.0%	3.2%
1985	81 030	22 350	810	810	6 700	47 030	3 330
Distribution	100%	27.6%	1.0%	1.0%	8.3%	58.0%	4.1%
Average Annual Growth	5.5%	4.1%	6.5%	15.2%	7.5%	5.7%	8.1%
<u>WEIGHT LOAD FACTOR (Millions)</u>							
1975	55	78	55	58	56	47	55
1985	59	79	56	53	54	54	59

Appendix 10

INTERNATIONAL SCHEDULED TRAFFIC ON TWO MAJOR ROUTE GROUPS: 1975-1985
(In millions)

Year	Passengers carried	Passenger-kilometres	Freight tonne-kilometres	Total tonne-kilometres performed	
NORTH ATLANTIC					
	All carriers	I A T A	A I R L I N E S		
1975	9.2	8.9	56 126	2 888	8 288
1976	10.2	9.8	62 796	3 232	9 248
1977	10.7	10.3	66 750	3 811	10 197
1978	13.2	12.6	82 403	4 268	12 044
1979 ¹	15.8	15.0	85 568	4 239	12 290
1980	16.7	15.0	85 463	4 245	12 282
1981	17.2	15.0	102 016	5 390	15 060
1982	16.3	14.9	100 942	5 382	15 001
1983	17.4	15.9	107 863	5 947	16 279
1984	19.5	17.8	120 650	6 919	18 450
1985	21.0	19.3	132 408	7 091	19 727
Annual % growth 1975-85	8.6	8.0	9.0	9.4	9.1
INTRA-EUROPEAN (AEA AIRLINES)²					
1975	37.9	34 443	583	3 743	
1976	40.8	38 342	664	4 217	
1977	43.9	42 985	709	4 659	
1978	46.9	46 851	748	5 057	
1979	49.7	49 818	804	5 364	
1980	48.5	48 150	784	5 203	
1981	49.8	49 449	772	5 296	
1982	49.3	49 210	786	5 316	
1983	49.2	49 130	840	5 374	
1984	52.6	52 335	956	5 787	
1985	55.9	55 645	998	6 131	
Annual % growth 1975-85	4.0	4.9	5.5	5.1	

- Notes:**
- Beginning in January 1979, transatlantic flights to and from Miami were considered as North Atlantic.
 - Association of European Airlines (AEA), is composed of 20 member airlines: Aer Lingus, Air France, Alitalia, Austrian Airlines, British Airways, British Caledonian, Finnair, Iberia, Icelandair (Flugfelag), JAT (Jugoslavenski Aerotransport), Luxair, KLM Royal Dutch Airlines, Lufthansa, Olympic Airways, Sabena, SAS (Scandinavian Airlines System), Swissair, TAP (Transportes Aereos Portuguesas), THY (Turkish Airlines), and UTA (Union de Transports Aériens which has no intra-European scheduled services).

Sources: IATA, World Air Transport Statistics.
AEA, Traffic and Operating Data of AEA Airlines, 1975-1983.
AEA, Revised data for 1984 and preliminary data for 1985.

Appendix 11

WORLD INTERNATIONAL SCHEDULED TRAFFIC
(Ranking of States with respect to Tonne-kilometres Performed)

State or Group of States	Rank Number in		International Tonne-Kilometres Performed (Passenger, Freight, Mail)				Average Annual Increase (Per cent)
	1985	1975	1985 (Millions)	Percentage Distribution (Per cent)	1975 (Millions)	Percentage Distribution (Per cent)	
United States	1	1	14 780	17.3	6 903	18.5	7.9
United Kingdom	2	2	8 125	9.5	3 451	9.3	8.9
Japan	3	5	5 674	6.6	1 908	5.1	11.5
France	4	3	5 358	6.3	2 507	6.7	7.9
Germany, Federal Republic of	5	4	4 597	5.4	2 062	5.5	8.3
Netherlands, Kingdom of the	6	6	3 214	3.8	1 560	4.2	7.5
Singapore	7	15	3 080	3.6	639	1.7	17.0
Republic of Korea	8	18	2 390	2.8	600	1.6	14.8
Australia	9	9	2 331	2.7	1 176	3.2	7.1
Canada	10	7	2 250	2.6	1 341	3.6	5.3
Italy	11	8	1 924	2.2	1 177	3.2	5.0
Switzerland	12	10	1 893	2.2	978	2.6	6.8
Spain	13	12	1 675	2.0	854	2.3	7.0
Thailand	14	20	1 360	1.6	480	1.3	11.0
Saudi Arabia	15	38	1 320	1.5	136	0.4	25.5
USSR	16	13	1 309	1.5	822	2.2	4.8
Scandinavia ¹	17	11	1 266	1.5	918	2.5	3.3
Brazil	18	14	1 233	1.4	744	2.0	5.2
Israel	19	22	1 182	1.4	416	1.1	11.0
India	20	19	1 128	1.3	531	1.4	7.8
Belgium	21	16	1 093	1.3	631	1.7	5.6
Philippines	22	28	920	1.1	250	0.7	13.9
New Zealand	23	23	895	1.0	377	1.0	9.0
South Africa	24	21	882	1.0	475	1.3	6.4
Pakistan	25	24	785	0.9	295	0.8	10.3
Mexico	26	26	773	0.9	274	0.7	10.9
Malaysia	27	41	705	0.8	116	0.3	19.8
Greece	28	25	628	0.7	292	0.8	8.0
Gulf States ²	29	50	599	0.7	85	0.2	21.6
Indonesia	30	46	595	0.7	107	0.3	18.7
Total 35 States			73 964	86.3	32 105	86.2	
Other States			11 576	13.7	5 184	13.8	
Total All States			85 540	100.0	37 289	100.0	8.7

Notes: 1. Denmark, Norway and Sweden.
2. Bahrain, Oman, Qatar, and United Arab Emirates.

Appendix 12

MAJOR INTERNATIONAL SCHEDULED AIRLINES
(Ranked with Respect to International Tonne-Kilometres Performed)

AIRLINE	STATE	Rank Number in		International Scheduled Tonne-kilometres Performed (Passengers, Freight, Mail)				
		1985	1975	1985 millions	Percentage Distribution per cent	1975 millions	Percentage Distribution per cent	Average Annual Growth Rate per cent
JAL	Japan	1	5	5 297	6.2	1 903	5.1	10.8
BRITISH AIRWAYS	United Kingdom	2	2	4 828	5.6	2 916	7.8	5.2
LUFTHANSA	Germany, Fed. Rep. of	3	3	4 597	5.4	2 062	5.5	8.3
AIR FRANCE	France	4	4	4 424	5.2	1 932	5.2	8.6
PAN AM	United States	5	1	4 077	4.8	2 979	8.0	3.2
KLM	Netherlands, Kingdom of the	6	6	3 153	3.7	1 540	4.1	7.4
SIA	Singapore	7	17	3 080	3.6	639	1.7	17.0
TWA	United States	8	7	2 748	3.2	1 286	3.4	7.9
NORTHWEST	United States	9	16	2 513	2.9	647	1.7	14.5
KOREAN AIR	Korea, Republic of	10	19	2 390	2.8	600	1.6	14.8
QANTAS	Australia	11	8	2 331	2.7	1 176	3.2	7.1
CATHAY PACIFIC	United Kingdom	12	29	1 954	2.3	330	0.9	19.5
FLYING TIGER	United States	13	24	1 946	2.3	480	1.3	15.0
ALITALIA	Italy	14	8	1 922	2.2	1 176	3.2	5.0
SWISSAIR	Switzerland	15	10	1 723	2.0	978	2.6	5.8
IBERIA	Spain	16	12	1 675	2.0	854	2.3	7.0
AIR CANADA	Canada	17	13	1 408	1.6	848	2.3	5.2
THAI INTERNATIONAL	Thailand	18	32	1 355	1.6	288	0.8	16.7
SAUDIA	Saudi Arabia	19	52	1 320	1.5	136	0.4	25.5
AEROFLOT	USSR	20	14	1 309	1.5	822	2.2	4.8
SAS	Denmark, Norway, Sweden	21	11	1 266	1.5	918	2.5	3.3
VARIG	Brazil	22	15	1 205	1.4	713	1.9	5.4
EL AL	Israel	23	27	1 182	1.4	416	1.1	11.0
SABENA	Belgium	24	18	1 093	1.3	631	1.7	5.6
AIR INDIA	India	24	22	1 093	1.3	526	1.4	7.6
BRITISH CALEDONIAN	United Kingdom	26	45	1 016	1.2	157	0.4	20.5
UTA	France	27	20	934	1.1	575	1.5	5.0
PAL	Philippines	28	34	920	1.1	250	0.7	13.9
AIR NEW ZEALAND	New Zealand	29	28	895	1.0	377	1.0	9.0
SAA	South Africa	30	25	882	1.0	475	1.3	6.4
TOTAL 30 AIRLINES				64 536	75.4	28 630	76.8	
OTHER AIRLINES				21 004	24.6	8 659	23.2	
TOTAL ALL AIRLINES				85 540	100.0	37 289	100.0	8.7

Appendix 13

OPERATING REVENUES AND EXPENSES: 1975-1985 (The Scheduled Airlines of ICAO Contracting States¹ Total Domestic and International Services)

DESCRIPTION	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ²
TOTAL FIGURES (In millions of United States Dollars)											
OPERATING REVENUES											
Scheduled Services											
Passenger	30 174	34 211	39 617	46 625	56 483	69 930	74 433	74 860	77 600	81 350	87 500
Freight	4 196	4 763	5 450	6 463	7 709	9 468	9 523	9 560	10 830	12 450	12 500
Mail	796	822	942	974	1 141	1 501	1 425	1 480	1 470	1 500	1 500
Total Scheduled Services	35 166	39 796	46 009	54 062	65 333	80 899	85 381	85 900	89 900	95 300	101 500
Non-scheduled Services	1 612	1 852	2 024	2 076	2 418	3 149	3 682	3 100	2 800	2 900	3 400
Incidental	1 531	1 752	2 311	2 630	3 003	3 628	3 929	4 240	5 600	6 600	7 100
TOTAL OPERATING REVENUES	38 309	43 400	50 344	58 769	70 755	87 676	92 992	93 240	98 300	104 800	112 000
OPERATING EXPENSES											
Flight Operations	12 215	13 081	14 973	16 700	24 045	34 345	36 677	34 600	33 050	33 100	36 000
Flight Crew Salaries and Expenses	3 292	3 540	4 092	4 756	5 687	6 856	6 792	6 800	6 870	6 830	7 300
Aircraft Fuel and Oil	7 305	7 942	9 169	10 220	15 995	24 881	27 318	25 420	23 610	23 200	25 000
Other (Insurance, Rental, Training, etc.)	1 618	1 600	1 713	1 724	2 362	2 608	2 567	2 380	2 570	3 070	3 700
Maintenance and Overhaul	4 688	5 167	5 918	6 854	8 013	9 283	9 640	9 150	9 620	10 050	10 800
Depreciation and Amortization	3 065	3 296	3 694	4 380	4 699	5 449	5 968	6 330	6 920	7 210	7 700
User Charges and Station Expenses (Total)	6 351	7 068	8 318	9 920	11 895	13 713	13 828	14 540	15 260	16 040	17 300
Landing and Associated Airport Charges	1 424	1 582	1 774	2 208	2 679	3 099	3 241	3 100	3 160	3 040	3 200
Route Facility Charges ³	***	***	596	668	798	992	1 096	1 410	1 430	1 400	1 500
Station Expenses	4 927	5 486	5 949	7 044	8 418	9 622	9 490	10 030	10 670	11 600	12 600
Passenger Services	3 514	3 885	4 602	5 618	6 718	7 967	8 085	8 540	8 810	9 170	9 900
Ticketing, Sales and Promotion	5 491	6 117	7 055	8 601	10 390	12 484	13 800	14 510	15 810	16 540	17 800
General, Administrative & Other Operating Expenses	2 255	2 629	3 155	3 595	4 258	5 069	5 687	5 730	6 730	7 590	8 500
TOTAL OPERATING EXPENSES	37 579	41 244	47 715	55 669	70 109	88 310	93 684	93 400	96 200	99 700	108 000
OPERATING RESULT (PROFIT OR LOSS(-))	730	2 156	2 628	3 100	736	-635	-692	-160	2 100	5 100	4 000
OPERATING RESULT AS % OF OPERATING REVENUE	1.9%	5.0%	5.2%	5.3%	1.0%	-0.7%	-0.7%	-0.2%	2.1	4.9%	3.6%
NET RESULT											
NET RESULT AS % OF OPERATING REVENUE	-0.2%	1.9%	3.3%	4.1%	0.8%	-1.0%	-1.2%	-1.4%	-0.7%	1.9	***
PERCENTAGE DISTRIBUTION OF TOTAL OPERATING REVENUES AND EXPENSES (In Percentages)											
OPERATING REVENUES											
Scheduled Services											
Passenger	78.8	78.8	78.7	79.3	79.8	79.8	80.1	80.2	78.9	77.6	78.1
Freight	10.9	11.0	10.8	11.0	10.9	10.8	10.2	10.3	11.0	11.9	11.2
Mail	2.1	1.9	1.9	1.7	1.6	1.7	1.5	1.6	1.5	1.4	1.3
Total Scheduled Services	91.8	91.7	91.4	92.0	92.3	92.3	91.8	92.1	91.4	90.9	90.6
Non-scheduled Services	4.2	4.3	4.0	3.5	3.4	3.6	4.0	3.3	2.9	2.8	3.0
Incidental	4.0	4.0	4.6	4.5	4.2	4.1	4.2	4.6	5.7	6.3	6.4
TOTAL OPERATING REVENUES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OPERATING EXPENSES											
Flight Operations	32.5	31.7	31.4	30.0	34.3	38.9	39.1	37.0	34.3	33.2	33.3
Flight Crew Salaries and Expenses	8.8	8.6	8.6	8.5	8.1	7.8	7.2	7.3	7.1	6.9	6.8
Aircraft Fuel and Oil	19.4	19.3	19.2	18.4	22.8	28.2	29.2	27.2	24.5	23.3	23.1
Other (Insurance, Rental, Training, etc.)	4.3	3.8	3.6	3.1	3.4	2.9	2.7	2.6	2.7	3.0	3.4
Maintenance and Overhaul	12.5	12.5	12.4	12.3	11.4	10.5	10.3	9.8	10.0	10.1	10.0
Depreciation and Amortization	8.1	8.0	7.7	7.9	6.7	6.2	6.4	6.8	7.2	7.2	7.1
User Charges and Station Expenses (Total)	16.9	17.1	17.4	17.0	17.0	15.5	14.8	15.6	15.9	16.1	16.0
Landing and Associated Airport Charges	3.8	3.8	3.7	4.0	3.8	3.5	3.5	3.3	3.3	3.0	3.0
Route Facility Charges	***	***	1.3	1.2	1.1	1.1	1.2	1.5	1.5	1.4	1.4
Station Expenses	13.1	13.3	12.5	12.7	12.0	10.9	10.1	10.7	11.1	11.6	11.7
Passenger services	9.4	9.4	9.7	10.1	9.6	9.0	8.6	9.1	9.2	9.2	9.2
Ticketing, Sales and Promotion	14.6	14.9	14.8	15.5	14.8	14.1	14.7	15.5	16.4	16.6	16.5
General, Administrative & Other Operating Expenses	6.0	6.4	6.6	6.4	6.1	5.7	6.1	6.1	7.0	7.6	7.9
TOTAL OPERATING EXPENSES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix 13 (Cont'd)

OPERATING REVENUES AND EXPENSES: 1975-1985
(The Scheduled Airlines of ICAO Contracting States¹
Total Domestic and International Services)

DESCRIPTION	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ²
OPERATING REVENUES AND EXPENSES PER TONNE-KILOMETRES PERFORMED (In United States Cents)											
OPERATING REVENUES											
Scheduled Services											
Passenger	58.0	58.8	63.1	64.4	68.3	83.1	86.4	85.1	84.3	82.2	81.7
Freight	24.1	24.5	25.3	27.1	29.8	35.2	33.6	32.9	33.2	33.7	33.9
Mail	32.1	31.6	34.5	34.8	38.9	47.2	43.4	43.9	41.5	39.1	38.7
Total Scheduled Services	48.9	49.6	52.8	54.6	58.6	70.9	72.5	71.3	70.2	68.2	68.6
Non-scheduled Services	30.0	30.6	30.9	32.4	41.8	48.3	58.1	53.0	52.3	50.4	48.7
OVERALL AVERAGE⁴	49.5	50.3	53.8	55.8	60.1	72.6	74.9	73.8	73.6	72.0	72.3
OPERATING EXPENSES											
Flight Operations	15.8	15.2	16.0	15.8	20.4	28.4	29.6	27.4	24.8	22.7	23.2
Flight Crew Salaries and Expenses	4.3	4.1	4.4	4.5	4.8	5.7	5.5	5.4	5.1	4.7	4.7
Aircraft Fuel and Oil	9.4	9.2	9.8	9.7	13.6	20.6	22.1	20.1	17.7	15.9	16.1
Other (Insurance, Rental, Training, etc.)	2.1	1.8	1.9	1.7	2.0	2.2	2.0	1.9	1.9	2.1	2.4
Maintenance and Overhaul	6.1	6.0	6.3	6.5	6.8	7.7	7.8	7.3	7.2	6.9	7.0
Depreciation and Amortization	4.0	3.8	3.9	4.2	4.0	4.5	4.8	5.0	5.2	5.0	5.0
User Charges and Station Expenses (Total)	8.2	8.2	8.9	9.4	10.1	11.4	11.1	11.5	11.4	11.0	11.1
Landing and Associated Airport Charges	1.8	1.8	1.9	2.1	2.3	2.6	2.6	2.5	2.4	2.1	2.1
Route Facility Charges ³	***	***	0.6	0.6	0.7	0.8	0.9	1.1	1.1	1.0	1.0
Station Expenses	6.4	6.4	6.4	6.7	7.2	8.0	7.7	7.9	8.0	8.0	8.0
Passenger Services	4.6	4.5	4.9	5.3	5.7	6.6	6.5	6.8	6.6	6.3	6.4
Ticketing, Sales and Promotion	7.1	7.1	7.5	8.2	8.9	10.3	11.1	11.5	11.9	11.4	11.5
General, Administrative & Other Operating Expenses	2.9	3.0	3.4	3.4	3.6	4.2	4.6	4.5	5.0	5.2	5.5
OVERALL AVERAGE	48.6	47.8	51.0	52.8	59.5	73.1	75.5	74.0	72.1	68.5	69.7
PASSENGER REVENUE PER PASSENGER-KILOMETRE (In United States Cents)											
SCHEDULED SERVICES	5.2	5.3	5.7	5.8	6.2	7.5	7.8	7.7	7.6	7.4	7.4
OPERATING REVENUES AND EXPENSES PER TONNE-KILOMETRE AVAILABLE (In United States Cents)											
OPERATING REVENUES											
Scheduled Services	24.6	25.9	28.1	30.8	33.6	39.2	40.5	40.0	40.2	39.6	39.8
Non-scheduled Services	18.9	19.5	20.2	22.5	27.6	31.1	37.5	33.6	33.0	32.8	30.7
OVERALL AVERAGE⁴	25.3	26.6	29.0	31.8	34.8	40.5	42.2	41.6	42.4	42.0	42.1
OPERATING EXPENSES											
Flight Operations	8.1	8.0	8.6	9.0	11.8	15.9	16.7	15.4	14.2	13.3	13.5
Flight Crew Salaries and Expenses	2.2	2.2	2.4	2.6	2.8	3.2	3.1	3.0	3.0	2.7	2.7
Aircraft Fuel and Oil	4.8	4.9	5.3	5.5	7.9	11.5	12.4	11.3	10.2	9.3	9.4
Other (Insurance, Rental, Training, etc.)	1.1	1.0	1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.3	1.4
Maintenance and Overhaul	3.1	3.2	3.4	3.7	3.9	4.3	4.4	4.1	4.1	4.0	4.1
Depreciation and Amortization	2.0	2.0	2.1	2.4	2.3	2.5	2.7	2.8	3.0	2.9	2.9
User Charges and Station Expenses (Total)	4.2	4.3	4.8	5.4	5.9	6.3	6.3	6.5	6.6	6.4	6.5
Landing and Associated Airport Charges	0.9	1.0	1.0	1.2	1.3	1.4	1.5	1.4	1.4	1.2	1.2
Route Facility Charges ³	***	***	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6
Station Expenses	3.3	3.4	3.4	3.8	4.1	4.4	4.3	4.5	4.6	4.7	4.7
Passenger Services	2.3	2.4	2.7	3.0	3.3	3.7	3.7	3.8	3.8	3.7	3.7
Ticketing, Sales and Promotion	3.6	3.7	4.1	4.7	5.1	5.8	6.2	6.5	6.8	6.6	6.7
General, Administrative & Other Operating Expenses	1.5	1.6	1.8	1.9	2.1	2.3	2.5	2.6	3.0	3.1	3.2
OVERALL AVERAGE	24.8	25.3	27.5	30.1	34.4	40.7	42.5	41.7	41.5	39.9	40.6

- Notes:**
1. Excluding domestic operations within the USSR.
 2. Preliminary estimates.
 3. Included under station expenses up to 1976.
 4. Includes incidental revenues.

Source: ICAO Digests of Statistics, Series F.

Appendix 14

ESTIMATED OPERATING REVENUES AND EXPENSES: 1975-1984
 (The Scheduled Airlines of ICAO Contracting States; International Services Only)

Description	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
TOTAL FIGURES (In millions of United States Dollars)										
OPERATING REVENUES										
Scheduled Services										
Passenger	14 116	15 993	19 031	23 552	29 371	36 465	37 772	38 123	38 703	39 540
Freight	2 833	3 310	3 895	4 678	5 776	7 094	7 213	7 119	7 305	7 945
Mail	487	486	503	596	695	818	794	806	780	805
Total Scheduled Services	17 436	19 789	23 434	28 825	35 836	44 377	45 779	46 048	46 788	48 290
Non-Scheduled Services	1 347	1 562	1 798	1 929	2 014	2 755	2 854	2 572	2 475	2 640
Incidental	1 413	1 400	1 693	2 368	2 942	3 330	3 195	3 420	4 253	4 740
TOTAL OPERATING REVENUES	20 197	22 752	26 925	33 122	40 792	50 461	51 828	52 040	53 517	55 670
OPERATING EXPENSES										
Flight Operations	6 385	6 751	7 631	8 923	12 907	18 761	19 720	18 605	17 166	16 895
Flight Crew Salaries and Expenses	1 479	1 597	1 796	2 027	2 559	2 987	2 849	2 840	2 766	2 695
Aircraft Fuel and Oil	3 960	4 233	4 824	5 382	8 668	13 853	14 964	13 860	12 400	12 000
Other (Insurance, Rental, Training, etc.)	946	920	1 011	1 464	1 680	1 921	1 907	1 905	2 000	2 200
Maintenance and Overhaul	2 349	2 625	3 094	3 819	4 480	5 258	5 039	4 974	5 217	5 404
Depreciation and Amortization	1 718	1 824	2 160	2 561	2 726	3 244	3 419	3 502	3 689	4 002
User Charges and Station Expenses (total)	3 191	3 624	4 337	5 553	6 716	7 897	7 800	7 720	7 676	7 814
Landing and Associated Airport Charges	920	1 045	1 128	1 616	1 835	2 287	2 211	2 120	2 060	1 974
Route Facility Charges ²	***	***	500	557	660	755	959	990	1 026	1 060
Station Expenses	2 271	2 580	2 709	3 380	4 221	4 853	4 630	4 610	4 590	4 780
Passenger Services	1 878	2 055	2 480	3 231	3 893	4 705	4 671	4 674	4 725	4 975
Ticketing, Sales and Promotion	3 350	3 750	4 238	5 476	6 577	8 278	8 690	8 677	9 223	9 501
General, Administrative and Other Operating Expenses	1 427	1 524	2 027	2 474	3 015	3 539	3 448	3 598	3 898	4 189
TOTAL OPERATING EXPENSES	20 298	22 153	25 967	32 037	40 314	51 682	52 787	51 750	51 645	52 780
OPERATING RESULT	-101	599	958	1 085	478	-1 221	-959	290	1 872	2 875
OPERATING RESULT AS % OF OPERATING REVENUE	-0.50	2.63	3.56	3.27	1.17	-2.42	-1.85	0.56	3.50	5.17
NET RESULT	-576	66	487	668	280	-1 696	-1 565	-756	-414	1 169
NET RESULT AS % OF OPERATING REVENUE	-2.85	0.29	1.81	2.02	0.69	-3.36	-3.02	-1.45	0.77	2.10
PERCENTAGE DISTRIBUTION OF TOTAL OPERATING REVENUES AND EXPENSES (In Percentages)										
OPERATING REVENUES										
Scheduled Services										
Passenger	69.9	70.3	70.7	71.1	72.0	72.3	72.9	73.3	72.3	71.0
Freight	14.0	14.6	14.5	14.1	14.1	14.1	13.9	13.7	13.6	14.3
Mail	2.4	2.1	1.9	1.8	1.7	1.6	1.5	1.5	1.5	1.5
Total Scheduled Services	86.3	87.0	87.0	87.0	87.9	87.9	88.3	88.5	87.4	86.8
Non-Scheduled Services	6.7	6.9	6.7	5.8	4.9	5.5	5.5	4.9	4.6	4.7
Incidental	7.0	6.1	6.3	7.2	7.2	6.6	6.2	6.6	8.0	8.5
TOTAL OPERATING REVENUES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OPERATING EXPENSES										
Flight Operations	31.5	30.5	29.4	27.9	32.0	36.3	37.4	36.0	33.3	32.0
Flight Crew Salaries and Expenses	7.3	7.2	6.9	6.5	6.4	5.8	5.4	5.5	5.4	5.1
Aircraft Fuel and Oil	19.5	19.1	18.6	16.8	21.5	26.8	28.4	26.8	24.0	22.7
Other (Insurance, Rental, Training, etc.)	4.7	4.2	3.9	4.6	4.2	3.7	3.6	3.7	3.9	4.2
Maintenance and Overhaul	11.6	11.9	11.9	11.9	11.1	10.2	9.5	9.6	10.1	10.2
Depreciation and Amortization	8.5	8.2	8.3	8.0	6.7	6.3	6.5	6.7	7.1	7.6
User Charges and Station Expenses (total)	15.7	16.4	16.7	17.3	16.7	15.3	14.8	14.9	14.9	14.8
Landing and Associated Airport Charges	4.5	4.7	4.3	5.0	4.6	4.4	4.2	4.1	4.0	3.8
Route Facility Charges ¹	***	***	1.9	1.7	1.6	1.5	1.8	1.9	2.0	2.0
Station Expenses	11.2	11.6	10.4	10.6	10.5	9.4	8.8	8.9	8.9	9.0
Passenger Services	9.2	9.3	9.6	10.1	9.7	9.1	8.8	9.0	9.2	9.4
Ticketing, Sales and Promotion	16.5	16.3	16.3	17.1	16.3	16.0	16.5	16.8	17.9	18.0
General, Administrative and Other Operating Expenses	7.0	6.9	7.8	7.7	7.5	6.9	6.5	7.0	7.5	8.0
TOTAL OPERATING EXPENSES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix 14 (cont'd)

ESTIMATED OPERATING REVENUES AND EXPENSES: 1975-1984

(The Scheduled Airlines of ICAO Contracting States; International Services Only)

Description	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
OPERATING REVENUES AND EXPENSES PER TONNE-KILOMETRE PERFORMED (In United States Cents)										
OPERATING REVENUES										
Scheduled Services										
Passenger	58.0	58.4	63.0	67.1	73.4	85.8	83.6	83.6	82.7	77.8
Freight	24.7	25.0	25.9	27.6	30.5	35.0	33.2	31.5	29.1	27.6
Mail	40.3	38.7	38.5	44.2	49.3	54.2	50.6	49.3	45.9	44.0
Total Scheduled Services	47.1	47.2	50.3	54.0	59.4	69.0	66.9	66.0	63.6	59.3
Non-Scheduled Services	31.6	32.1	34.6	37.6	42.3	51.2	55.5	53.7	58.0	56.5
OVERALL AVERAGE²	48.9	48.6	52.0	56.6	62.7	72.4	70.4	69.7	68.7	64.6
OPERATING EXPENSES										
Flight Operations	15.5	14.4	14.7	15.3	19.8	26.9	26.8	25.0	22.0	19.6
Flight Crew Salaries and Expenses	3.6	3.4	3.5	3.6	3.9	4.3	3.9	3.8	3.5	3.1
Aircraft Fuel and Oil	9.6	9.1	9.3	9.2	13.3	19.9	20.3	18.6	15.9	13.9
Other (Insurance, Rental, Training, etc.)	2.3	2.0	2.0	2.5	2.6	2.8	2.6	2.6	2.6	2.6
Maintenance and Overhaul	5.7	5.6	6.0	6.5	6.9	7.6	6.9	6.7	6.7	6.3
Depreciation and Amortization	4.2	3.9	4.2	4.4	4.2	4.7	4.6	4.7	4.7	4.6
User Charges and Station Expenses (total)	7.7	7.7	8.4	9.5	10.3	11.3	10.6	10.3	9.9	9.1
Landing and Associated Airport Charges	2.2	2.2	2.2	2.7	2.8	3.3	3.0	2.8	2.7	2.3
Route Facility Charges ¹	***	***	1.0	1.0	1.0	1.1	1.3	1.3	1.3	1.2
Station Expenses	5.5	5.5	5.2	5.8	6.5	7.0	6.3	6.2	5.9	5.6
Passenger Services	4.5	4.4	4.8	5.5	6.0	6.8	6.4	6.3	6.1	5.8
Ticketing, Sales and Promotion	8.1	8.0	8.2	9.4	10.1	11.9	11.8	11.6	11.8	11.0
General, Administrative and Other Operating Expenses	3.5	2.3	3.9	4.3	4.6	5.1	4.7	4.8	5.0	4.9
OVERALL AVERAGE	49.2	47.4	50.1	54.8	62.0	74.2	71.7	69.4	66.3	61.3
PASSENGER REVENUE PER PASSENGER-KILOMETRE (In United States Cents)										
SCHEDULED SERVICES	5.33	5.25	5.67	6.04	6.61	7.78	7.52	7.68	7.58	7.14
OPERATING REVENUES AND EXPENSES PER TONNE-KILOMETRE AVAILABLE (In United States Cents)										
OPERATING REVENUES										
Scheduled Services	24.8	25.4	27.7	31.2	35.0	39.8	39.2	38.6	38.2	36.7
Non-Scheduled Services	20.6	20.9	23.1	23.4	27.8	33.4	36.9	34.4	36.9	36.2
OVERALL AVERAGE²	26.3	26.6	29.2	32.9	37.2	42.2	41.6	41.0	41.4	40.1
OPERATING EXPENSES										
Flight Operations	8.3	7.9	8.3	8.9	11.8	15.7	15.8	14.7	13.3	12.2
Flight Crew Salaries and Expenses	1.9	1.9	1.9	2.1	2.3	2.5	2.3	2.3	2.1	1.9
Aircraft Fuel and Oil	5.2	5.2	5.2	5.4	7.9	11.6	12.0	10.9	9.6	8.7
Other (Insurance, Rental, Training, etc.)	1.2	1.1	1.1	1.5	1.5	1.6	1.5	1.5	1.6	1.6
Maintenance and Overhaul	3.1	3.1	3.4	3.8	4.1	4.4	4.1	3.9	4.0	3.9
Depreciation and Amortization	2.2	2.1	2.3	2.5	2.5	2.7	2.8	2.8	2.9	2.9
User Charges and Station Expenses (total)	4.2	4.2	4.7	5.5	6.1	6.6	6.3	6.1	6.0	5.6
Landing and Associated Airport Charges	1.2	1.2	1.2	1.6	1.7	1.9	1.8	1.7	1.6	1.4
Route Facility Charges ¹	***	***	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8
Station Expenses	3.0	3.0	2.9	3.3	3.9	4.1	3.7	3.6	3.6	3.4
Passenger Services	2.4	2.4	2.7	3.2	3.6	3.9	3.8	3.7	3.7	3.6
Ticketing, Sales and Promotion	4.4	4.4	4.6	5.4	6.0	6.9	7.0	6.8	7.1	6.8
General, Administrative and Other Operating Expenses	1.9	1.9	2.2	2.5	2.8	3.0	2.8	2.8	3.0	3.0
OVERALL AVERAGE	26.4	25.9	28.1	31.8	36.8	43.2	42.4	40.8	40.0	38.0

Notes: 1. Included under station expenses up to 1976.
2. Includes incidental revenues.

Source: ICAO Digests of Statistics, Series F.

Appendix 15

CONSOLIDATED BALANCE SHEET: 1975-1985
 (The Scheduled Airlines of ICAO Contracting States¹; in millions of U.S. dollars)

ASSETS AND LIABILITIES	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 ²
ASSETS											
1. Current assets	11 953	13 673	16 165	18 894	21 655	24 418	23 846	25 101	28 990	32 518	36 000
2. Equipment purchase funds	736	765	1 441	2 073	2 416	2 494	1 936	1 753	1 590	1 684	1 800
3. Other special funds	203	124	189	125	368	369	1 362	540	421	660	800
4. Flight equipment before depreciation	35 420	36 859	40 779	50 801	59 211	68 645	73 251	76 719	80 709	85 018	91 000
4.1 Less: Reserve for depreciation	-14 867	-15 273	-18 065	-23 847	-28 011	-28 223	-28 942	-31 580	-31 063	-33 292	-38 000
4.2 Flight equipment after depreciation	20 553	21 586	22 714	26 954	31 200	40 422	44 309	45 139	49 646	51 726	53 000
5. Ground property and equipment before depreciation	7 699	7 773	8 995	10 291	11 926	14 113	15 720	17 210	18 674	20 515	23 000
5.1 Less: Reserve for depreciation	-3 262	-3 462	-4 270	-5 036	-5 277	-6 112	-7 220	-7 911	-8 631	-9 275	-11 300
5.2 Ground property and equipment after depreciation	4 437	4 311	4 725	5 255	6 649	8 001	8 500	9 299	10 043	11 240	11 700
6. Land	171	136	165	230	230	328	254	411	401	602	600
7. Investments in affiliated companies	1 029	1 064	1 124	1 325	1 469	1 080	2 110	1 921	1 265	1 543	1 800
8. Deferred charges	562	543	595	605	974	1 210	1 089	1 353	1 868	1 768	1 900
8.1 Development and pre-operating costs	174	134	139	106	177	180	323	373	449	363	500
8.2 Other deferred charges	388	410	456	498	802	1 049	766	980	1 419	1 405	1 400
9. Intangible assets	247	207	132	191	283	156	303	333	627	720	800
10. Other assets	1 133	1 382	1 319	1 893	3 161	4 248	3 535	3 526	3 594	3 525	3 600
11. TOTAL ASSETS	41 117	43 792	47 769	57 543	69 404	82 655	87 244	89 376	98 261	104 985	112 000
LIABILITIES											
12. Current liabilities	8 837	9 110	10 539	12 727	15 214	18 539	22 104	22 082	24 926	26 489	28 000
13. Unearned transportation revenues	2 290	3 136	3 756	4 527	6 040	7 110	6 594	6 908	7 526	7 457	7 700
14. Deferred credits	1 888	2 314	2 164	2 337	2 801	3 043	3 417	3 399	3 776	4 146	4 500
15. Operating reserves	262	514	609	468	953	849	846	923	884	1 066	1 300
16. Self insurance reserve	292	170	187	285	407	431	460	423	500	516	600
17. Other reserves	1 637	1 680	2 521	3 414	3 781	2 993	3 035	2 272	3 542	4 566	5 700
18. Advances from affiliated companies	311	305	285	283	450	331	1 170	1 027	212	190	300
19. Other liabilities	713	715	1 041	1 063	721	2 587	1 418	1 403	1 179	1 262	1 500
20. Long-term debt	16 108	16 241	15 594	18 963	23 856	30 516	32 575	36 335	39 009	38 212	37 000
21. Capital stock	4 679	4 522	5 022	5 696	7 045	7 601	7 813	6 966	8 702	9 597	11 000
22. Capital surplus	2 517	2 771	3 020	3 778	4 043	4 793	4 669	5 397	7 077	8 477	10 000
23. Net balance of unappropriated retained earnings	1 587	2 309	3 030	4 001	4 093	3 861	3 143	2 241	1 288	3 006	4 400
24. TOTAL LIABILITIES	41 117	43 792	47 769	57 543	69 404	82 655	87 244	89 376	98 261	104 985	112 000

NOTES: 1. Excluding domestic operations within the USSR.
 2. Data are preliminary.

SOURCE: ICAO Digests of Statistics, Series F.

Appendix 16

FLIGHT CREW PRODUCTIVITY AND COSTS: 1975-1984
(International Scheduled Airlines of ICAO Contracting States)¹

Year	Total number of flight crew	Flight crew costs (Mill.US\$)	Aircraft hours flown ('000)	No. of crew employed per 1000 hours flown	Crew cost per hour flown (US\$)	Crew cost per tonne-km. available (US\$)
1975	87 500	3 060	11 542	7.6	265	2.2
1976	90 000	3 281	12 077	7.5	272.	2.2
1977	95 000	3 877	12 500	7.6	310	2.4
1978	96 500	4 498	13 032	7.4	345	2.6
1979	99 700	5 654	13 988	7.1	404	2.8
1980	102 500	6 822	14 076	7.3	485	3.2
1981	103 000	6 761	13 578	7.6	498	3.1
1982	103 000	6 300	13 348	7.7	472	3.0
1983	103 500	6 200	13 685	7.6	453	2.9
1984	104 500	6 100	14 310	7.3	426	2.7

Note: 1. Excluding China and the USSR.

Source: ICAO Digest of Statistics, Series F and T.

Appendix 17

SELECTED INDICATORS OF SCHEDULED AIRLINE PERSONNEL PRODUCTIVITY IN 1975 AND 1985¹

Selected Scheduled Airlines Category of Personnel ²	Number of Personnel		Remuneration (U.S. Dollars)				Change + or - Per cent	Total Tonnage- Available ³		Total TEA per Employee		Change + or - Per cent	Total TEA per \$ of Remuneration		Change + or - Per cent		
	1975	1985	Total Remuneration		Average per Employee			1975	1985	1975	1985		1975	1985		1975	1985
			Thousands		Employees												
										Millions			Thousands				
AIR LINES/AMLI/ALITE																	
Pilots and Co-Pilots	272	253	5 936	9 618	21 824	38 816	74	**	**	1 632	2 158	32	75	57	-24		
Other Flight Crew	-	-	-	-	-	-	-	**	**	-	-	-	-	-	-		
All Other Personnel	5 587	5 536	48 968	106 081	8 765	19 167	119	**	**	78	99	25	8	5	-45		
Total Personnel	5 859	5 789	54 904	115 699	9 771	19 986	113	464	346	76	94	24	8	5	-38		
AIR FREN																	
Pilots and Co-Pilots	67	98	***2/	2 261	***3/	23 071	***	**	**	1 537	2 296	49	***	100	***		
Other Flight Crew	19	33	603	504	7 025	15 375	***	**	**	5 421	6 818	76	***	446	***		
All Other Personnel	1 058	1 554	2 719	6 052	2 570	3 894	52	**	**	87	145	49	38	37	-3		
Total Personnel	1 144	1 685	3 322	8 817	2 904	5 233	80	103	225	90	134	49	31	26	-16		
AIR CANADA																	
Pilots and Co-Pilots	1 461	1 791	43 624	98 966	29 859	55 257	85	**	**	2 819	2 828	0	94	51	-46		
Other Flight Crew	71	-	1 922	-	37 711	-	-	**	**	58 000	-	-	2 131	-	-		
All Other Personnel	19 635	19 916	258 159	494 404	13 148	26 824	89	**	**	210	254	21	14	10	-38		
Total Personnel	21 167	21 707	503 715	593 370	14 549	27 335	91	4 118	5 065	195	253	19	14	9	-36		
AIR INDIA																	
Pilots and Co-Pilots	191	264	1 530	3 128	8 010	11 868	48	**	**	3 508	7 530	115	438	636	45		
Other Flight Crew	155	144	977	2 659	4 303	11 521	83	**	**	4 323	13 806	219	696	1 198	75		
All Other Personnel	10 491	17 369	29 887	69 176	2 849	3 987	40	**	**	64	135	80	22	29	32		
Total Personnel	10 837	17 757	32 394	75 963	2 569	4 155	39	670	1 688	62	112	81	21	27	29		
BRITISH AIRWAYS⁴																	
Pilots and Co-Pilots	3 150	2 092	53 124	69 843	16 865	33 290	97	**	**	1 729	3 662	112	102	110	8		
Other Flight Crew	581	390	7 468	9 475	12 886	24 808	92	**	**	9 372	19 641	110	727	792	9		
All Other Personnel	38 129	35 698	291 318	465 076	7 640	13 920	82	**	**	143	227	59	19	16	-16		
Total Personnel	41 860	38 180	352 932	544 394	8 407	15 157	80	5 445	7 640	130	212	63	15	14	-7		
BAWING																	
Pilots and Co-Pilots	2 815	2 634	110 610	240 194	39 293	91 190	132	**	**	2 014	3 463	72	51	38	-26		
Other Flight Crew	975	1 187	25 133	47 026	25 727	39 818	54	**	**	5 814	7 684	32	224	194	-14		
All Other Personnel	30 267	35 493	428 203	939 240	14 148	26 327	86	**	**	187	256	37	13	10	-23		
Total Personnel	34 057	39 314	543 946	1 539 768/	16 559	38 967	135	5 649	9 121	164	231	39	10	6	-40		
NETFLAIR																	
Pilots and Co-Pilots	197	263	1 216	9 261	6 173	35 213	470	**	**	1 855	3 776	104	300	107	-64		
Other Flight Crew	66	88	360	2 475	5 455	28 125	416	**	**	5 530	11 284	104	1 014	401	-81		
All Other Personnel	8 255	10 743	14 406	54 105	1 234	5 222	203	**	**	64	92	109	25	18	-28		
Total Personnel	8 618	11 094	15 982	67 841	1 854	6 135	230	365	993	42	90	114	23	15	-35		
JAPAN AIR LINES																	
Pilots and Co-Pilots	949	1 450	***5/	***2/	***3/	***3/	***	**	**	4 314	6 133	62	***2/	***2/	***2/		
Other Flight Crew	995	705	55 374	168 057	28 382	74 372	162	**	**	4 115	12 614	207	74	56	-24		
All Other Personnel	18 624	18 380	235 133	627 197	12 625	34 124	170	**	**	220	484	120	17	14	-18		
Total Personnel	20 568	20 535	290 307	787 254	14 114	38 337	172	4 094	8 093	199	433	118	14	11	-22		
QUANTAS AIRWAYS																	
Pilots and Co-Pilots	69	***2/	1 492	***2/	***2/	26 522	***	**	**	2 681	***2/	***	109	***2/	***		
Other Flight Crew	18	259	180*	18 968	*10 000	71 336	***	**	**	18 218	4 120	***	1 028	34	***		
All Other Personnel	1 844	6 357	10 639	106 654	5 764	16 777	191	**	**	100	168	68	17	10	-41		
Total Personnel	1 931	6 616	12 501	125 622	4 474	18 988	193	185	1 067	96	181	68	15	8	-47		

Appendix 17 (Cont'd)

SELECTED INDICATORS OF SCHEDULED AIRLINE PERSONNEL PRODUCTIVITY IN 1975 AND 1985¹

Selected Scheduled Airline Category of Personnel ²	Number of Personnel		Remuneration (U.S. Dollars)				Change + or - Per cent	Total Tonne-Km. Available ³		Productivity of Personnel					
	1975	1985	Total Remuneration		Average per Employee			1975	1985	Total TRA per Employee		Change + or -			
			1975	1985	1975	1985				1975	1985	1975	1985		
	Thousands	Thousands	Thousands	Thousands	Per cent	Millions		Millions	Thousands	Thousands	Per cent	Per cent			
CAPIAS															
Pilots and Co-Pilots	616	547	23 287	43 971	37 804	80 386	113	**	**	3 219	6 000	86	85	75	-12
Other Flight Crew	258	177	8 528	13 108	33 047	74 056	124	**	**	7 486	18 562	141	233	230	7
All Other Personnel	12 561	11 306	157 728	270 338	12 557	23 911	90	**	**	158	290	84	13	12	-8
Total Personnel	13 435	12 030	189 543	327 417	14 108	27 217	93	1 983	3 282	148	275	84	10	10	-
TOTAL AIR MARC															
Pilots and Co-Pilots	66	163	3 764	7 062	26 727	43 325	62	**	**	3 697	3 018	-16	138	70	-48
Other Flight Crew	27	58	187	2 050	14 333	24 746	162	**	**	9 037	8 359	-8	630	240	-62
All Other Personnel	2 157	3 692	14 653	25 210	6 793	6 828	1	**	**	113	153	16	17	20	18
Total Personnel	2 250	3 914	16 804	24 322	7 448	8 789	17	244	492	108	126	17	15	14	-7
BARBA															
Pilots and Co-Pilots	34	21	362	656	10 056	31 228	211	**	**	1 111	2 238	101	110	72	-35
Other Flight Crew	6	4	34	77	6 000	19 250	221	**	**	6 647	11 750	76	1 111	610	-63
All Other Personnel	460	529	980	3 487	2 130	6 592	209	**	**	87	89	2	41	13	-68
Total Personnel	501	554	1 378	4 220	2 745	7 417	177	40	47	60	85	6	29	11	-62
BAE															
Pilots and Co-Pilots	1 216	1 116	46 783	77 558	38 473	69 496	81	**	**	1 542	2 315	35	41	30	-27
Other Flight Crew	62	-	2 122	-	34 226	-	-	**	**	30 429	-	-	895	-	-
All Other Personnel	13 600	17 182	179 416	410 056	13 192	23 921	81	**	**	140	138	-2	11	6	-44
Total Personnel	14 878	18 298	228 319	487 614	15 248	28 707	74	1 899	2 360	128	129	1	8	5	-38
TNA															
Pilots and Co-Pilots	2 339	1 758	100 350	153 922	42 903	87 555	104	**	**	4 181	5 196	24	97	59	-39
Other Flight Crew	1 158	796	31 854	48 639	27 509	61 106	122	**	**	8 446	11 476	36	307	188	-39
All Other Personnel	33 263	24 899	450 812	748 905	13 553	30 881	128	**	**	294	367	25	22	12	-64
Total Personnel	34 760	27 453	583 018	1 252 178 ⁴	15 960	45 612	188	9 780	9 135	264	353	25	17	7	-59
TALIC															
Pilots and Co-Pilots	651	733	15 211	21 025	23 366	28 683	23	**	**	2 201	3 907	78	94	136	63
Other Flight Crew	373	301	5 070	3 270	13 592	17 548	29	**	**	3 842	9 315	148	283	343	92
All Other Personnel	13 371	14 523	49 944	84 869	3 725	5 762	34	**	**	107	173	62	29	30	3
Total Personnel	14 395	17 557	70 225	121 164	4 878	8 901	41	1 433	2 864	100	163	63	20	24	20

Notes and Symbols:

- The figures shown against the year are those reported for 31 December of the previous year.
- Definitions of Terms:
Pilots and Co-Pilots: Self explanatory.
Other Flight Crew: Flight engineers, radio operators, and navigators, but not cabin attendants.
All Other Personnel: Personnel not included in the above categories, but including cabin attendants.
- Total international and domestic, scheduled and non-scheduled.
- British Airways for 1974 consists of B.A. Overseas, B.A. European, Chabrian, Channel Island and Northeast Airlines. 1985 data include British Airways.
- Data combined below.
- Masters and TRA - Total includes employee benefits, payroll taxes and pensions.

*** Not available.
** Not applicable.
- Nil
0 Magnitude less than half the unit value.

Source: Data reported to ICAO on the ATR Forms D-1 (Pilot and Personnel) and A-1 (Scheduled Airline Traffic).

Appendix 18

ECONOMETRIC MODELS OF DEMAND FOR WORLD SCHEDULED AIR TRAFFIC

The basic models form assumed was:

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

For the model of passenger traffic,

$$y = \text{revenue passenger-kilometres (RPK)}$$

$$x_1 = \text{gross domestic product in real terms (GDP)}$$

$$x_2 = \text{passenger revenue per passenger-kilometre in real terms (PYIELD)}$$

For the model of freight traffic,

$$y = \text{freight tonne-kilometres (FTK)}$$

$$x_1 = \text{world exports in real terms (EXP)}$$

$$x_2 = \text{freight revenue per freight tonne-kilometre in real terms (FYIELD)}$$

The a , b_1 and b_2 are constant coefficients whose values were obtained by statistical estimation, using econometric analysis. The b_1 and b_2 are equal to the elasticities of demand with respect to the corresponding x_1 and x_2 .

Annual data were used in the estimations, covering a period of 22 years excluding USSR and China. ICAO and the International Monetary Fund (IMF) were the sources of the airline and general economic data, respectively, used in the models.

Estimated Passenger Model:

$$\ln \text{ RPK} = 2.83 + 2.05 \ln \text{ GDP} - 0.70 \ln \text{ PYIELD}; \quad R^2 = 0.996$$

(15.2) (3.6)

Estimated Freight Model:

$$\ln \text{ FTK} = 4.87 + 1.30 \ln \text{ EXP} - 0.77 \ln \text{ FYIELD} \quad R^2 = 0.994$$

(11.0) (4.9)

The figures in brackets are the "t" statistics of the corresponding coefficient estimates.

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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;

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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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