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Chapter 1
INTRODUCTION

1.1 This study has been prepared pursuant to ICAO Assembly Resolution A21-26 [Clauses 1b) and d)], which directs the Council to undertake analyses of regional differences in the level of international passenger fares and corresponding differences in the level of airline costs. Covering the year 1991, this study is the seventeenth in an annual series, the one for the year 1990 having been published as Circular 242.

1.2 For 17 international route groups, comprising all international routes, passenger, freight and mail revenue yield data are presented in Chapter 2 for scheduled services along with passenger and freight revenue yield data for non-scheduled operations. For the same route groups regional differences in the costs related to the scheduled service passenger yields are presented in Chapter 3. Finally, certain of the causes of regional differences in costs are identified in Chapter 4.

1.3 The sources of data used in the study are given in Appendix 1 together with information on the sample sizes on which revenue and cost data are based. The method of analysis used in the study is presented in Appendix 2 together with information on the margins of uncertainty which should be borne in mind when considering the results of studies of this kind.

1.4 Overviews of published passenger fares and freight rates are available in separate annual publications issued by the Organization in response to Clause 1a) of Assembly Resolution A21-26. Circular 239 covers September 1991 and Circular 246 covers September 1992.

1.5 Unless indicated otherwise, all references in this Circular to "cents" mean "U.S. cents", and all references to "dollars" mean "U.S. dollars".

Chapter 2
LEVELS OF FARES AND RATES

Passenger traffic

2.1 Estimates of average unit passenger revenues in 1991 by route group are presented in Table 2-1.

2.2 The first column of data in Table 2-1 shows the average revenue per passenger-kilometre for scheduled passenger traffic on each route group. The data are presented without distinction among class of travel or among fare type. Thus they represent the over-all weighted average for all individual routes on all route groups and for all the fares that apply. The over-all average revenue per passenger-kilometre was estimated at 9.15 cents for 1991, but the route group averages vary from a high of 21.9 cents in local Europe to a low of 6.2 cents on routes across the South Pacific.

2.3 The second column of data shows the average revenue per passenger-kilometre for non-scheduled passenger traffic recorded for each route group. The figures here range from a high of 13.1 cents in local Asia/Pacific to a low of 4.4 cents on routes between Canada, Mexico and the United States. On some route groups, notably those where the revenue yield is comparable to or above that from scheduled services, the non-scheduled traffic concerned is of a very limited volume and highly specific nature, carried on an *ad hoc* basis at a relatively high cost (e.g. local South America and local Asia/Pacific), while on other route groups the traffic is of greater volume and carried on a more regular basis at a lower cost (e.g. in local Europe). The third and fourth data columns of Table 2-1 show the reported non-scheduled revenue per passenger-kilometre for traffic carried by scheduled airlines and for traffic carried by non-scheduled operators; there are in some cases significant differences between the two figures in the same route group.

2.4 The final four columns of Table 2-1 show unit revenues for scheduled services and non-scheduled flights in terms of the average revenue per seat-kilometre. The effect of the higher load factors generally achieved by non-scheduled flights compared with scheduled services is brought out by this presentation. The per seat-kilometre revenues for non-scheduled operations are in most cases much closer to the revenues for scheduled services than the comparable per passenger-kilometre revenues.

2.5 On a world-wide basis, the estimated average revenue per passenger-kilometre for scheduled services (excluding incidental revenues) at 9.15 cents in 1991 showed an increase of some 4 per cent over the 8.77 cents recorded for 1990. Among the 17 individual route groups, all showed an increase in revenue yield between 1990 and 1991. Showing significant increases were routes in local Europe (from 20.0 to 21.9 cents), in local Middle East (from 13.4 to 15.0 cents), between Europe and the Middle East (from 9.5 to 10.9 cents), between Europe/Middle East and Africa (from 9.5 to 10.3 cents), across the South Atlantic (from 8.3 to 9.0 cents), and across the South Pacific (from 5.5 to 6.2 cents). The changes in revenue yields shown between 1990 and 1991 for routes involving Europe, the Middle East and Africa in part reflect the strengthening of the U.S. dollar against most of the national currencies in those areas. On the other hand, the changes in revenue yields shown for routes involving Asia in part reflect the weakening of the U.S. dollar against some of the major national currencies in that area, in particular against the Japanese yen. Hence the

Table 2-1. Estimated average unit passenger revenues by international route group[1], 1991

Route group[2]	Revenue (cents) per passenger-kilometre				Revenue (cents) per seat-kilometre			
		Non-scheduled flights				Non-scheduled flights		
	Scheduled services[3]	All categories	By international scheduled airlines	By other carriers	Scheduled services[3]	All categories	By international scheduled airlines	By other carriers
1. Between North America and Central America/ Caribbean	8.0	6.1	6.1	–	4.9	4.8	4.8	–
2. Between and within Central America and Caribbean	11.6	–	–	–	6.8	–	–	–
3. Between Canada, Mexico and the United States	8.0	4.4	4.4	–	5.0	3.4	3.4	–
4. Between North America/ Central America/Caribbean and South America	8.5	6.1	6.1	–	5.2	4.4	4.4	–
5. Local South America	10.5	9.1	9.1	–	6.3	6.2	6.2	–
6. Local Europe	21.9	5.8	6.3	5.7	12.7	4.8	5.2	4.7
7. Local Middle East	15.0	9.2	9.2	–	9.0	3.4	3.4	–
8. Local Africa	13.1	–	–		7.1	–	–	–
9. Between Europe and Middle East	10.9	8.9	9.5	6.5	7.1	5.8	5.8	5.6
10. Between Europe/Middle East and Africa	10.3	6.0	10.4	5.7	6.5	4.5	5.8	4.4
11. North Atlantic	6.7	6.8	7.5	5.3	4.7	4.9	5.2	4.2
12. Mid Atlantic	7.3	5.5	–	5.5	4.9	4.3	–	4.3
13. South Atlantic	9.0	5.6	6.4	5.2	5.8	4.1	4.2	4.0
14. Local Asia/Pacific	9.9	13.1	13.1	–	6.7	8.6	8.6	–
15. Between Europe/Middle East/Africa and Asia/Pacific	7.8	6.5	9.5	4.9	5.2	4.7	6.1	3.8
16. North and Mid Pacific	7.4	6.9	6.9	–	5.1	4.9	4.9	–
17. South Pacific	6.2	–	–	–	4.3	–	–	–

1. Data for scheduled services, where presented, are considered representative for all airlines operating in the route group concerned. Data for non-scheduled flights represent only carriers for which substantive information was available, and are only presented where they include two or more carriers. The representative nature of the data for both scheduled services and non-scheduled flights is described in Appendix 1 and the margins of uncertainty to be taken into account regarding the scheduled service data are discussed in Appendix 2.
2. More detailed definition of the route groups may be found in Appendix 3 on the reverse of the revenue questionnaire.
3. These figures do not generally include such incidental operating revenues as may be attributed to international passenger traffic. On individual route groups incidental operating revenues not included may represent up to an additional 4 per cent over the average revenue quoted.

relative change between 1990 and 1991 would in many cases be significantly different if expressed in the national currencies of the airlines concerned. A brief evaluation of this effect is given in Chapter 3, paragraphs 3.10 to 3.12.

2.6 The analyses above relate only to the average unit revenues for all airlines combined on each route group. There can be wide variations around these averages shown among individual airlines. In the case of scheduled services the variation among airlines of the revenue per passenger-kilometre for each route group is shown in Table 2-2. For a few route groups the unit revenues for individual airlines do not vary very much from the route group average (for example for routes across the North Atlantic). However, on most route groups the unit revenues differ significantly among airlines, reflecting differing route structures and traffic mix among other factors.

Freight and mail traffic

2.7 Average reported unit freight and mail revenues in 1991 by international route group are presented in Table 2-3.

2.8 The first column of data in Table 2-3 shows the average revenue per tonne-kilometre performed for all scheduled freight traffic on each route group whether carried on passenger, combination or all-freight aircraft. The variation among route group averages ranges from a high of 86.4 cents in local Europe to a low of 23.8 cents on routes across the South Pacific. Comparing with data for the previous year, 15 route groups out of the 17 showed an increase while the remaining 2 route groups showed a decrease. The largest increases were for routes in local Middle East (from 42.2 to 57.3 cents), and between Europe and the Middle East (from 31.4 to 38.8 cents). Decreases in revenue yield were recorded for routes between and within Central America and the Caribbean (from 66.1 to 61.7 cents), and in local South America (from 42.2 to 40.7 cents). The relatively large change in revenue yield on routes involving South America and the Middle East (and for mail in the case of Africa) should be considered in the context of the higher representation of airlines from these regions in 1990 compared with 1991 (South America: 16 in 1990 compared with 12 in 1991; the Middle East: 5 compared with 4; Africa: 17 compared with 11). In the case of routes involving Central America and the Caribbean, the over-all number of carriers represented in 1990 and 1991 was the same, but the composition of the carriers which reported data was different. A major regional carrier whose data were included in the 1990 sample did not submit figures for 1991.

2.9 The second and third columns of data in Table 2-3 show the average revenue per tonne-kilometre performed for scheduled freight traffic carried on passenger or combination aircraft and that obtained for traffic carried on all-freight aircraft. In comparing the two sets of figures it may be seen that the revenue yield from all-freight aircraft is frequently lower than that achieved from passenger and combination aircraft, as the former are more likely to carry large shipments which are subject to quantity discount rates or low specific commodity rates. However, for some route groups where there is large cargo capacity offered at competitive rates on wide-body passenger and combination aircraft (for example on routes between Europe/Middle East/Africa and Asia/Pacific), the difference in revenue yield is relatively small. In the case of the routes across the North Atlantic the higher freight revenue yield on all-cargo services reflect the data of a major all-freight air carrier which also includes courier traffic and revenue in its figures. If data for this carrier were excluded, there would be little difference in the level of the freight revenue yield shown for passenger or combination aircraft and all-freight aircraft on routes across the North Atlantic.

2.10 The fourth column of data in Table 2-3 shows the average revenue per tonne-kilometre performed for all non-scheduled freight traffic on each international route group. The unit revenues among route groups range from a high of 85.5 cents on routes between Europe and the Middle East to a low of 19.5

Table 2-2. Variation in scheduled passenger revenue yield among airlines, 1991

Route group (short title)	Average revenue (cents) per passenger-kilometre (all airlines from Table 2-1)	Number of airlines in this analysis	Revenue (cents) per passenger-kilometre for individual airlines																				
			3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 and over
			Number of airlines																				
1. North-Central America	8.0	11				4	2	2	1	0	0	0	0	0	0	1	1						
2. Central America	11.6	6					1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2[1]
3. North America	8.0	12				3	5	2	0	2													
4. North-South America	8.5	17				2	4	6	2	0	2	0	0	0	0	0	0	0	0	0	1		
5. South America	10.5	8						1	1	4	2												
6. Europe	21.9	30						1	2	1	1	2	2	1	0	2	0	1	1	0	1	4	11[2]
7. Middle East	15.0	5										1	1	0	1	0	1	0	1				
8. Africa	13.1	10									4	0	2	1	1	1	0	0	1				
9. Europe-Middle East	10.9	26					2	5	4	3	3	3	2	2	0	2							
10. Europe-Africa	10.3	29			2	1	1	3	4	5	2	5	2	2	0	0	0	0	0	1	0	0	1[3]
11. North Atlantic	6.7	37		1	11	12	7	5	1														
12. Mid Atlantic	7.3	11			2	3	3	3															
13. South Atlantic	9.0	14				2	3	3	4	2													
14. Asia/Pacific	9.9	22			1	3	2	4	2	3	4	0	2	1									
15. Europe-Asia/Pacific	7.8	43		5	7	7	6	11	5	0	0	1	1										
16. North/Mid Pacific	7.4	17	1	4	2	4	1	2	1	1	1												
17. South Pacific	6.2	8		1	0	3	2	1	1														

1. In the range from 24-25 (1) and 25-26 (1).
2. In the range from 23-24 (3), 25-26 (2), 26-27 (2), 27-28 (1), 29-30 (1), 30-31 (1) and 31-32 (1).
3. In the range from 34-35 (1).

Table 2-3. Estimated average unit freight and mail revenues by international route group, 1991[1]

Route group (short title)	Freight revenue (cents) per tonne-kilometre performed				Mail revenue (cents) per tonne-kilometre performed — scheduled services
	Scheduled services			Non-scheduled flights	
	Over-all	Passenger and combination aircraft	All-freight aircraft		
1. North-Central America	40.8	42.2	35.2	–	57.3
2. Central America	61.7	61.7	–	–	75.8
3. North America	37.1	37.7	25.0	–	36.9
4. North-South America	33.2	33.4	33.1	46.4	48.9
5. South America	41.1	44.7	33.7	–	73.2
6. Europe	86.4	89.6	66.7	58.0	67.1
7. Middle East	57.3	57.0	66.0	–	74.7
8. Africa	56.4	56.4	–	–	96.2
9. Europe-Middle East	38.8	42.8	25.4	85.5	65.7
10. Europe-Africa	39.9	43.2	28.9	29.1	52.2
11. North Atlantic	24.2	23.1	27.3	39.0	36.3
12. Mid Atlantic	27.7	26.3	34.2	57.9	48.1
13. South Atlantic	28.9	28.7	29.7	19.5	58.0
14. Asia/Pacific	37.1	38.2	32.6	29.3	52.8
15. Europe-Asia/Pacific	31.1	30.2	32.8	37.4	46.8
16. North/Mid Pacific	28.0	32.4	25.7	44.6	39.2
17. South Pacific	23.8	24.0	20.6	–	35.1

1. Data represent only carriers for which substantive information was available and are only presented where they include two or more carriers. The representative nature of the data is described in Appendix 1.

cents on routes across the South Atlantic. The figure for non-scheduled operations is actually higher than that for all-freight scheduled operations for seven of the ten comparable route groups. In some cases this reflects the specialized non-scheduled operations of one or two carriers. There were significant changes in average unit revenue between 1990 and 1991 for most of the nine route groups for which there are comparable data. These changes, in general, mainly reflect the volatility in revenue yields for this type of market. Route groups involving the Middle East also reflect, in part, the particular circumstances which affected that region between 1990 and 1991.

2.11 The final column of data in Table 2-3 shows the average revenue per tonne-kilometre performed for all mail traffic on each route group (virtually all international mail is carried on scheduled services). The route group averages range from a high of 75.8 cents on routes between and within Central America and the Caribbean to a low of 35.1 cents on those across the South Pacific. Between 1990 and 1991, 11 of the 17 route groups show increases in unit mail revenues, whereas the remaining 6 showed decreases. The most significant increases were on routes between North America and Central America/Caribbean (from

Table 2-4. Variation in scheduled freight revenue yield among airlines, 1991

Route group (short title)	Average revenue (cents) per tonne-kilometre (all airlines from Table 2-3)	Number of airlines in this analysis	Revenue (cents) per tonne-kilometre for individual airlines															
			0 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to 110	110 to 120	120 to 130	130 to 140	140 to 150	150 to 160	160 and over
			Number of airlines															
1. North-Central America	40.8	10			1	3	1	3	0	0	0	1	0	0	1				
2. Central America	61.7	5						1	0	1	1	0	0	0	0	0	0	0	2[1]
3. North America	37.1	12		1	4	3	2	1	1										
4. North-South America	33.2	18		1	8	1	2	2	2	1	0	0	0	0	0	0	0	0	1[2]
5. South America	40.7	9		1	0	5	0	1	1	0	0	0	0	1					
6. Europe	86.4	29						1	2	8	6	3	3	0	1	2	1	0	2[3]
7. Middle East	57.3	5				1	2	0	0	1	0	0	1						
8. Africa	56.4	9			1	3	0	0	3	0	1	0	0	0	0	0	0	1	
9. Europe-Middle East	38.8	25			2	5	6	5	3	3	0	1							
10. Europe-Africa	39.9	26			4	7	7	4	2	0	2								
11. North Atlantic	24.2	38		8	16	11	3												
12. Mid Atlantic	27.7	11		3	5	2	0	0	0	0	0	0	1						
13. South Atlantic	28.9	15			11	2	2												
14. Asia/Pacific	37.1	23			6	6	4	3	3	1									
15. Europe-Asia/Pacific	31.1	44		5	11	19	5	4											
16. North/Mid Pacific	28.0	18		3	9	3	1	1	1										
17. South Pacific	23.8	9		2	5	1	0	0	0	0	1								

1. In the range of 200-210 (2).
2. In the range of 160-170 (1).
3. In the range of 260-270 (2).

38.4 to 57.3 cents), between and within Central America and the Caribbean (from 61.7 to 75.8 cents), between North America/Central America/Caribbean and South America (from 39.7 to 48.9 cents), and in local Africa (from 69.3 to 96.2 cents). Decreases were recorded on routes between Europe/Middle East and Africa (from 57.1 to 52.2 cents), across the Mid Atlantic (from 52.2 to 48.1 cents), and across the South Atlantic (from 62.1 to 58.0 cents). As for freight, the relatively large change in revenue yield on routes involving Central America and the Caribbean, the Middle East, Africa and South America should be considered in the context of the difference in the representation of airlines from these areas between 1990 and 1991 (see 2.8 above). Unit mail revenues in general remain significantly higher than unit freight revenues on scheduled services except for routes between Canada, Mexico and the United States and in local Europe.

2.12 A notable feature of the mail unit revenue data is that for most of the route groups involving two or more regions there are substantial differences in the yield recorded by the carriers according to the region in which they are based. This distinction is particularly marked for the following route groups and regions:

between North America and Central America/Caribbean

all airlines 57.3 cents
North American airlines 53.4 cents
Central American and Caribbean airlines 76.7 cents;

between North America/Central America/Caribbean and South America

all airlines 48.9 cents
North American airlines 36.2 cents
South American airlines 72.5 cents;

North Atlantic

all airlines 36.3 cents
North American airlines 30.5 cents
European airlines 45.3 cents; and

North/Mid Pacific

all airlines 39.2 cents
North American airlines 31.1 cents
Asian airlines 52.8 cents.

These differences are to a large extent a result of comparatively low air mail conveyance rates being set by the United States authorities for originating mail.

2.13 In the case of unit freight revenues, the variation among individual airlines of the revenue per tonne-kilometre for scheduled services for each route group is shown in Table 2-4. For a few route groups the unit revenues for individual airlines do not vary very much from the route group average (for example on the three routes across the Atlantic). However, as for passenger traffic, on most route groups the unit revenues differ significantly among airlines.

Chapter 3

REGIONAL DIFFERENCES IN SCHEDULED PASSENGER FARES AND RELATED COSTS

Over-all financial results by international route group

3.1 Selected operational data and estimated financial results for the year 1991 are presented in Table 3-1 over-all and by route groups.

3.2 The first column of data in the table shows that the number of scheduled airlines operating jet services in each route group ranged from a low of 13 on South Pacific routes to a high of 73 serving routes in local Europe. It should be noted that propeller aircraft operations of these airlines are excluded from the study, as are the operations of some 107 small international airlines which operate propeller-driven aircraft exclusively; together these operations with propeller aircraft represented about 0.6 per cent of world international seat-kilometres in 1991 with their highest representations in any single route group being some 27 per cent between and within Central America and the Caribbean, and about 4 per cent in local Africa and in local Europe. Supersonic aircraft operations, which were also excluded, represented less than 0.1 per cent of world operations.

3.3 The operational data included in data columns 2 to 5 of Table 3-1 all have a significant effect on unit operating costs (see Chapter 4). There are considerable differences among route groups in the volume of traffic, the average length of flight stages, the average number of seats per aircraft and the average passenger load factor.

3.4 Financial results are presented in columns 6 to 8. When consulting these data it should be borne in mind that the revenue figures do not generally take into account the incidental operating revenues. Those incidental revenues which may be directly attributed to passenger traffic include revenues from passengers paying less than 25 per cent of the normal applicable fare, commissions received on sales of transportation on other carriers, "no-show" and cancellation fees (expenses incurred against these revenue items are included in the cost figures shown in column 7); these incidental revenues also include on a net basis capacity equalization payments arising from pooled and/or joint services as well as from the sale of own capacity to other carriers. Revenues accruing from the provision of services other than for air transportation (such as service and maintenance sales or handling services for third parties) and the corresponding costs are excluded from all figures presented in this study. An analysis of incidental revenue data on this basis for 1991 indicates that for international routes as a whole, relevant incidental revenues not included in Table 3-1 were about 0.12 cents per passenger-kilometre which, if added to the estimated world-wide unit revenue, increases it by some 1 per cent from 9.15 cents to 9.27 cents per passenger-kilometre. For individual route groups, the passenger-related incidental operating revenues may represent up to an additional four per cent over the average revenue quoted.

Table 3-1. Basic operational data and financial results for scheduled passenger services by international route groups, 1991[1]

Route group[2]	Operational data					Financial results[3]		
	Number of airlines (1)	Percentage of world's international traffic (available seat-km) (2)	Average length of flight stages (km) (3)	Average number of seats per aircraft[4] (4)	Average passenger load factor (%) (5)	Average revenue (cents) per pass-km[5] (6)	Average passenger costs (cents) per pass-km (7)	Ratio revenue/ costs[5,6] (8)
I. All world international routes	251	100.0	1 961	240	66	9.15	9.68	0.94
II. International route groups:								
1. Between North America and Central America/Caribbean	32	2.9	1 320	183	61	8.0	9.8	0.80
2. Between and within Central America and the Caribbean	22	0.2	661	145	58	11.6	12.3	0.95
3. Between Canada, Mexico and the United States	22	4.8	1 203	151	62	8.0	9.9	0.80
4. Between North America/ Central America/Caribbean and South America	38	3.1	2 275	221	61	8.5	8.6	1.00
5. Local South America	22	0.5	972	164	60	10.5	12.5	0.85
6. Local Europe	73	9.4	889	133	58	21.9	21.8	1.00
7. Local Middle East	16	0.7	890	179	60	15.0	14.1	1.05
8. Local Africa	35	0.5	949	146	54	13.1	14.7	0.90
9. Between Europe and Middle East	45	2.5	2 244	202	65	10.9	11.0	1.00
10. Between Europe/Middle East and Africa	67	4.1	3 006	255	64	10.3	10.3	1.00
11. North Atlantic	57	21.7	4 739	268	70	6.7	7.9	0.85
12. Mid Atlantic	22	2.4	4 400	283	67	7.3	8.3	0.90
13. South Atlantic	18	2.1	3 924	295	65	9.0	9.6	0.95
14. Local Asia/Pacific	58	11.2	1 852	270	68	9.9	9.2	1.05
15. Between Europe/Middle East/Africa and Asia/Pacific	70	16.7	4 324	308	67	7.8	8.1	0.95
16. North and Mid Pacific	27	13.8	5 733	334	69	7.4	8.0	0.95
17. South Pacific	13	3.4	5 186	328	70	6.2	6.9	0.90

1. Excluding operational and financial data attributed to supersonic and propeller-driven aircraft.
2. More detailed definition of the route groups may be found in Appendix 3 on the reverse of the revenue questionnaire.
3. The margins of uncertainty which should be considered in relation to these results are discussed in Appendix 2.
4. As defined by available seat-kilometres divided by aircraft-kilometres flown.
5. These figures do not generally include incidental operating revenues. For all international routes, that part of this additional revenue which may be directly attributed to international passenger traffic is about 0.12 cents per passenger-kilometre. On individual route groups it may represent up to an additional 4 per cent over the average revenue quoted.
6. Rounded to nearest twentieth for individual route groups.

3.5 The average operating cost per passenger-kilometre for all international routes was 9.68 cents (column 7), the figures for individual route groups ranging from a high of 21.8 cents in local Europe to a low of 6.9 cents on routes across the South Pacific. These estimated costs include such items as depreciation and interest charges, and sales commission paid, but exclude costs attributable to the carriage of freight and mail.

3.6 The ratio of passenger revenues to passenger costs (column 8) for international routes as a whole is estimated at 0.94 for the calendar year 1991, varying between individual route groups from 0.80 to 1.05. Taking into account relevant incidental revenues associated with international passenger traffic and margins of uncertainty in estimated revenues and costs (discussed in Appendix 2), the revenue/cost ratio for all international passenger traffic in 1991 is assessed as lying between 0.93 and 0.99, with a most likely value of 0.96.

3.7 Components of the total passenger costs are presented in Table 3-2. The primary breakdown is between "aircraft" operating costs, being those directly attributable to the operation of aircraft on each route group, and "other" operating costs. All the itemized data carry relatively wide margins of uncertainty and should be regarded as indicative only. Nevertheless, it appears that most of the individual items vary significantly among route groups.

Comparison of results for 1991 with those for 1990

3.8 An over-all comparison between data for 1991 and corresponding data for 1990 shows an increase of almost 1 per cent in the estimated passenger cost per available seat-kilometre, from 6.36 to 6.41 cents. Since the world-wide average load factor decreased 2 percentage points (from 68 to 66 per cent), the cost per passenger-kilometre shows an increase of about 4 per cent, from 9.35 to 9.68 cents. Unit revenues (excluding incidental operating revenues) also showed an increase of about 4 per cent, from 8.77 cents per passenger-kilometre to 9.15 cents in 1991 and as a result there was no change between the two years in the over-all revenue/cost ratio which remained at 0.94.

3.9 As far as the individual route groups are concerned, the year-to-year cost changes show wide variations which are accentuated by differences in trends in load factors. Between 1990 and 1991, 16 out of the 17 route groups showed increases in costs per passenger-kilometre, while the remaining route group showed a decrease. The most significant increases were recorded on routes in local South America (from 11.8 to 12.5 cents), in local Europe (from 20.0 to 21.8 cents), across the Mid Atlantic (from 7.7 to 8.3 cents), across the South Atlantic (from 8.7 to 9.6 cents), and across the North and Mid Pacific (from 7.2 to 8.0 cents). Between 1990 and 1991 only the routes between Europe and the Middle East showed a decrease in unit costs (from 11.3 to 11.0 cents).

3.10 The comparison of unit costs between 1990 and 1991 reflects a general decrease in the price of fuel (see Chapter 4), in conjunction with a general increase in most of the other costs. In particular, increases in costs related to aircraft operations (excluding fuel and oil) must in part be attributed to the significant decrease in aircraft average daily utilization between 1990 and 1991 (from 9.4 to 8.6 hours per day), thus increasing that portion of the aircraft unit cost which is based on fixed annual expenses. However, as with the revenue figures discussed in Chapter 2, the comparison has been in some cases affected by a change in the value of the United States dollar against other world currencies. Within the Americas, where most fares and rates are transacted in United States dollars, the changes in unit revenues generally reflect

Table 3-2. Estimated passenger costs[1] per passenger-kilometre by cost item, 1991

Route group (short title)	Total operating costs (cf. Table 3-1) (sum of columns 1-9)	Aircraft operating costs		Other operating costs						
		Aircraft operating costs excluding fuel and oil[2] (1)	Aircraft fuel and oil (2)	Landing and associated airport charges (3)	En-route facility charges (4)	Station expenses (5)	Passenger services (6)	Commission (7)	Ticketing, sales and promotion (8)	General, administrative and miscellaneous (9)
I. All:										
Cents	9.68	2.84	1.29	0.36	0.23	0.99	1.40	1.10	0.85	0.62
Percentage of total costs	100.0	29.3	13.3	3.7	2.4	10.2	14.5	11.4	8.8	6.4
II. International route groups:										
1. North-Central America	9.8	3.0	1.4	0.2	0.1	1.4	1.2	1.0	0.8	0.7
2. Central America	12.3	3.7	1.9	0.3	0.2	1.6	1.0	1.6	1.1	0.9
3. North America	9.9	3.1	1.4	0.2	0.1	1.4	1.3	1.3	0.6	0.5
4. North-South America	8.6	2.5	1.4	0.2	0.1	0.7	1.0	1.0	0.9	0.8
5. South America	12.5	3.7	2.0	0.5	0.4	1.1	1.4	1.3	1.1	1.0
6. Europe	21.8	6.2	1.7	1.7	1.0	3.3	2.8	2.0	2.3	0.8
7. Middle East	14.1	4.8	1.7	0.5	0.2	1.6	1.5	1.4	1.2	1.2
8. Africa	14.7	5.1	2.3	0.7	0.2	1.4	1.4	1.3	1.2	1.1
9. Europe-Middle East	11.0	3.6	1.3	0.4	0.3	1.1	1.4	1.0	1.0	0.9
10. Europe-Africa	10.3	3.0	1.6	0.4	0.4	0.8	1.5	0.9	0.9	0.8
11. North Atlantic	7.9	2.2	1.1	0.2	0.2	0.9	1.2	0.8	0.6	0.7
12. Mid Atlantic	8.3	2.3	1.4	0.2	0.2	0.6	1.3	0.7	0.8	0.8
13. South Atlantic	9.6	2.4	1.6	0.3	0.3	0.8	1.4	1.0	1.0	0.8
14. Asia/Pacific	9.2	3.0	1.2	0.4	0.1	0.9	1.4	0.9	0.9	0.4
15. Europe-Asia/Pacific	8.1	2.4	1.3	0.2	0.2	0.6	1.4	0.7	0.7	0.6
16. North/Mid Pacific	8.0	2.2	1.2	0.1	0.1	0.5	1.1	1.7	0.6	0.5
17. South Pacific	6.9	2.2	1.0	0.1	0.0	0.5	1.0	1.0	0.6	0.5

1. "Passenger" costs have been derived for each route group taking into account the contribution made by the revenue earned for the carriage of freight and mail on passenger flights towards covering total costs for these flights. Due to the margins of uncertainty in the estimates of individual cost items the figures should be regarded as indicative only.
2. This item includes flights operations expenses (cockpit crew salaries and expenses, rentals and insurance of flight equipment), aircraft maintenance and overhaul, and aircraft standing charges such as depreciation and interest charges.

market changes. Similarly, changes in unit costs in the Americas to a large extent reflect the general increase in costs as well as some operational changes, as the greater part of costs are generally borne in United States dollars.

3.11 Outside the Americas, for those route groups where the mix of national currencies generally weakened against the United States dollar (with some exceptions which caused local distortions), the changes shown in revenues and costs are effectively understated, in particular for those route groups involving Europe, the Middle East and, to a much lesser degree, Africa. Such is the case for routes in local Europe, where the United States dollar shows an over-all strengthening against related currencies between 1990 and 1991. For this route group, the increases in costs and revenues when these are expressed in United States dollars are lower than those recorded when costs and revenues are expressed in local currencies.

3.12 On the other hand, on routes involving Asia, where between 1990 and 1991 the mix of national currencies generally strengthened against the United States dollar, the changes shown in revenues and costs are overstated. Such is the case for the change in revenues and costs on routes across the North and Mid Pacific and to a lesser extent in local Asia/Pacific, where the increases in revenues and costs expressed in United States dollars are somewhat higher than those recorded when revenues and costs are expressed in local currencies.

3.13 Of the 17 route groups analysed in this study, six showed an increase in the revenue/cost ratio between 1990 and 1991, one route group showed a decrease while there was little change in the remaining 10 route groups. Increases in revenue/cost ratios were recorded for routes between North America/Central America/Caribbean and South America (from 0.95 to 1.00), in local Middle East (from 0.95 to 1.05), in local Africa (from 0.85 to 0.90), between Europe and the Middle East (from 0.85 to 1.00), between Europe/Middle East and Africa (from 0.95 to 1.00) and on routes across the South Pacific (from 0.85 to 0.90). Between 1990 and 1991, a decrease in the revenue/cost ratio was recorded on routes across the North Atlantic (from 0.90 to 0.85).

3.14 For the six route groups where there was an improvement in revenue/cost ratios, in all cases unit revenues in terms of cents per passenger-kilometres showed a more favourable development than unit costs expressed in terms of cents per seat-kilometres. Improvements in passenger load factors, which contributed to the increase in the revenue/cost ratio, were also achieved on four of the six route groups. For the remaining two of these six route groups, the increase in unit revenues more than offset the decrease in passenger load factors, resulting in an increase in revenue/cost ratios between 1990 and 1991. In the case of the routes across the North Atlantic, there was no change in the passenger load factor, and the main cause for the decrease in its revenue/cost ratio was a less favourable development in unit revenues than in costs. With regard to the 10 route groups for which there was no change in the revenue/cost ratio, changes in unit costs combined in most cases with decreasing passenger load factors to neutralize the improvements in unit revenues achieved.

Variations in revenue/cost ratios among airlines

3.15 The over-all financial results in Table 3-1 show that differences in revenues between route groups broadly reflect differences in costs. However, there are cases where individual airlines earn significant profits on some route groups while incurring losses on other route groups, and operations of these airlines on the former route groups could therefore be said to have subsidized operations on the latter groups during the period in question. In studies covering previous years, such apparent cross-subsidy between route groups

applied not only in the case of individual airlines but carried across to the averages for some regional groups of airlines. Since 1983, however, no such consistent cross-subsidy has been identifiable.

3.16 Analysis did, however, reveal several route groups within which the results obtained by different regional groups of airlines show significant differences. The figures shown below represent the **unrounded** revenue/cost ratio for each carrier group; however these figures should be used with caution because of the relatively large margin of uncertainty associated with them (see Appendix 2, paragraph 22).

3.17 Between 1990 and 1991, the airlines of the Middle East as a group showed the most significant over-all improvement in the revenue/cost ratio. The largest increase in the revenue/cost ratio for the Middle East carriers took place on the routes between Europe and the Middle East where their revenue/cost ratio increased from 0.83 in 1990 to 0.97 in 1991. The European carriers operating on these routes showed an even greater improvement, from 0.84 to 1990 to 1.03 in 1991. The improvements in the revenue/cost ratio shown on these routes must in part be attributed to the increase in average passenger load factor experienced by both airline groups. Between 1990 and 1991, the average passenger load factor for the Middle East airlines increased from 60 to 64 per cent, whereas the factor for the European airlines increased from 61 to 67 per cent. European airlines also showed a significant improvement in revenue/cost ratios on routes between Europe/Middle East and Africa, where they increased from 1.00 in 1990 to 1.07 in 1991. During the same period, African airlines operating on these routes showed only a marginal improvement in their ratio, from 0.91 to 0.92.

3.18 Aided in part by a small improvement in their passenger load factor, European airlines as a group managed to achieve a small improvement in the revenue/cost ratio on their routes across the North Atlantic, from 0.87 in 1990 to 0.89 in 1991. However, over the same period the North American airlines operating on these routes showed a significant decrease in their revenue/cost ratio, from 0.90 in 1990 to 0.83 in 1991. Between 1990 and 1991 European airlines also showed a marginal increase in their revenue/cost ratio on their routes between Europe/Middle East/Africa and Asia/Pacific, from 0.91 in 1990 to 0.93 in 1991. A similar improvement (from 0.97 to 0.99) was also achieved by the airlines registered in Asia /Pacific operating on these routes.

3.19 European airlines as a group were less fortunate on their routes across the South Atlantic, showing a decrease in their revenue/cost ratio from 1.00 in 1990 to 0.91 in 1991. To a large extent this decrease must be attributed to the significant reduction in the passenger load factor for the European airlines operating on these routes (from 73 per cent in 1990 to 66 per cent in 1991). On the other hand, over the same period South American airlines operating on these routes showed an improvement in revenue/cost ratio from 0.93 in 1990 to 0.96 in 1991. This improvement was achieved, despite declining passenger load factors, by a more favourable development in unit revenues than in costs.

3.20 Between 1990 and 1991, Latin American airlines showed a small increase in their revenue/cost ratio (from 0.90 to 0.92) on their routes between North America/Central America/Caribbean and South America. Over the same period North American airlines operating on these routes increased their revenue cost/ratio from 1.04 in 1990 to 1.08 in 1991. The lower improvement in revenue/cost ratio shown for the Latin American airlines must in part be attributed to a reduction in their passenger load factor between 1990 and 1991 (from 62 to 59 per cent). There was no change in the passenger load factor achieved by the North American airlines operating on this route group.

3.21 Between 1990 and 1991 there was a significant reduction in the revenue/cost ratios of all airline groups operating on routes across the North and Mid Pacific. North American airlines saw their revenue/cost ratio on these routes decrease from 1.02 in 1990 to 0.99 in 1991. On the same routes the revenue/cost ratio of airlines registered in Asia decreased from 0.90 to 0.83. The decrease in revenue/cost

ratio shown on these routes must in part be attributed to the reduction in passenger load factors. Between 1990 and 1991, the average passenger load factor for the North American airlines decreased from 72 to 67 per cent, whereas for the Asian airlines it only decreased from 74 to 71 per cent. In addition for the Asian airlines there was a less favourable development in unit revenues than costs.

3.22 On routes across the South Pacific, both North American and Pacific airline groups showed an improvement in revenue/cost ratios. Between 1990 and 1991, the North American airlines showed an increase from 0.84 to 0.88 compared with an increase from 0.85 to 0.92 in the revenue/cost ratio for airlines registered in the Pacific region. Part of the improvement shown for the Pacific airlines must be attributed to the increase in the average passenger load factor achieved on this route (from 68 to 71 per cent).

Table 3-3. Variation of revenue/cost ratios amongst airlines, 1991

Route group (short title)	Average revenue/cost ratio (all airlines, from Table 3-1)	Number of airlines in this analysis	less than 0.7	0.7 to 0.9	0.9 to 1.1	1.1 to 1.3	greater than 1.3
			Number of airlines				
I. All world international routes	0.94	84	4	32	40	8	
II. International route groups							
1. North-Central America	0.80	11	2	7	2		
2. Central America	0.95	6		3	1	2	
3. North America	0.80	12	5	5	2		
4. North-South America	1.00	15	1	4	6	4	
5. South America	0.85	7		4	2	1	
6. Europe	1.00	25		6	16	0	3
7. Middle East	1.05	3			3		
8. Africa	0.90	9	1	3	3	1	1
9. Europe-Middle East	1.00	20	1	7	8	3	1
10. Europe-Africa	1.00	26		11	10	3	2
11. North Atlantic	0.85	33	4	19	8	1	1
12. Mid Atlantic	0.90	15	1	5	8	1	
13. South Atlantic	0.95	14	1	4	8	1	
14. Asia/Pacific	1.05	18	1	4	8	5	
15. Europe-Asia/Pacific	0.95	37	4	14	11	8	
16. North/Mid Pacific	0.95	17	4	6	4	3	
17. South Pacific	0.90	7		5	2		

3.23 The variations in revenue/cost ratio among airlines in 1991 are shown in Table 3-3. On a few route groups the revenue/cost ratios for the airlines do not vary very much from the route group average (for example on routes across the South Pacific). However, on most route groups the ratios vary significantly among the airlines and the average revenue/cost ratios do not therefore adequately portray the economics of the operations. On three route groups the revenue/cost ratios of individual carriers ranged from less than 0.7 to greater than 1.3: on routes in local Africa, between Europe and the Middle East, and across the North Atlantic.

Chapter 4
FACTORS CAUSING REGIONAL DIFFERENCES IN COSTS

4.1 The financial analysis presented in Chapter 3 included estimates of the average cost per passenger-kilometre performed for each of the 17 international route groups. This chapter is concerned with assessments of factors which caused this average cost to vary among the route groups. Some main factors can be identified and their effects quantified but a number of other factors do not lend themselves to individual assessment and are therefore dealt with in a summary manner, although their combined influence on cost differences is significant.

4.2 The factors which have been considered are:

a) the effect on aircraft operating costs of differences among route groups in aircraft equipment being used;

b) the effect of differences among route groups in the average length of flight stages;

c) the effect of varying prices of fuel and oil in different parts of the world;

d) the effect of different levels of airport user charges in different parts of the world;

e) the effect of differences in the average load factor achieved on each route group; and

f) other factors.

An examination of the influence exercised by each of the above on the operating costs for traffic in the route groups is made below and the resulting variations in the costs per passenger-kilometre from the world average are subsequently presented in Table 4-5 and discussed in paragraphs 4.21 and 4.22 of this chapter.

Aircraft mix and stage length
[factors a) and b)]

4.3 The volume of traffic on a route and the geographical characteristics of the route (in particular the lengths of flight stages) determine the sizes of aircraft that are engaged in the traffic, the number of seat-kilometres per departure and per flying hour that can be produced by these aircraft, and the possible utilization of the aircraft in terms of flying hours per year. For these reasons, the geographical characteristics of a route group strongly influence the operating costs per seat-kilometre that will be incurred on that route group. Effects on these costs of differences among the route groups in aircraft mix and average stage length are discussed below.

4.4 In general, the aircraft operating costs per aircraft-kilometre or per seat-kilometre on a long-haul flight are lower than on a short-haul flight, mainly because of the higher block speed that may be achieved on a long-haul flight and the generally higher aircraft daily utilization recorded. Similarly, large aircraft which may be used where traffic density is high have lower aircraft operating costs per seat-kilometre than

small aircraft. The combined impact of these two factors may be illustrated by looking at the average aircraft operating costs incurred in international passenger service in 1991 for different categories of aircraft. Table 4-1 presents the average aircraft operating costs per block hour and per available seat-kilometre for five categories of aircraft, grouped according to their size and by the length of haul for which they were generally used in 1991. The average hourly cost varied from $2 780 for narrow-body short-haul aircraft to $7 060 for wide-body long-haul aircraft, but primarily because of their greater productivity the average aircraft operating cost per available seat-kilometre (adjusted to exclude costs attributable to freight and mail traffic) of the wide-body long-haul aircraft was, at 2.4 cents, one of the lowest for any category. In 1991 the same cost level as the one shown above was also achieved for the narrow-body long-haul aircraft; the types of aircraft included in this group (the B707, DC8 and IL62) are fairly old and therefore have relatively low standing charges. At the other end of the spectrum the narrow-body short-haul aircraft averaged 4.2 cents per seat-kilometre, which is some 75 per cent higher than the figure for long-haul aircraft.

Table 4-1. Operational and cost data for aircraft categories, 1991 (international scheduled passenger services)

Grouping of subsonic aircraft	Primary jet *types* operated on international scheduled services[1]	Percentage of world's *international* traffic (available seat-km) (%)	Average number of seats[2]	Average *length* of flight stages operated (km)	Average utilization[3] (hours/day)	*Aircraft operating costs*[4]	
						Dollars per block hour	Cents per available seat-km[5]
World	–	100.0	240	1 961	8.6	4 990	2.7
Narrow-body, short-haul	A320 B737 DC9 MD80	10.2	119	884	7.0	2 780	4.2
Narrow-body, medium-haul	B727 B757 TU154	7.4	156	1 299	7.2	2 940	2.9
Narrow-body, long-haul	IL62	1.5	171	2 788	5.5	3 390	2.4
Wide-body, medium-haul	A300 A310 B767 IL86 L1011	17.7	223	2 337	8.3	5 170	3.0
Wide-body, long-haul	B747 B767-300 DC10 L1011-500 MD11	63.2	325	4 669	10.4	7 060	2.4

1. Only aircraft types providing more than 0.5 per cent of the world international scheduled available seat-kilometres in 1991 are listed in this column. The categorization of aircraft types is based on the average number of seats and average length of flight stages operated in 1991.
2. Available seat-kilometres divided by aircraft-kilometres flown.
3. Including domestic and non-scheduled operations of the international airlines concerned.
4. Data in these columns include flight operations expenses, aircraft fuel and oil (at the world average cost of 20.0 cents per litre), aircraft maintenance and overhaul, per and aircraft standing charges such as depreciation and interest charges. If prevailing regional prices rather than the world average price were to be used for aircraft fuel and oil there would be no change in the per seat-kilometre cost data presented, but small changes in some of the per block hour data.
5. Aircraft operating costs have been adjusted in this case to exclude costs attributable to freight and mail traffic.

4.5 *Aircraft operational data for each route group (excluding utilization effects) are shown in* Table 4-2. The average block speed achieved is shown to be significantly higher on route groups with a long average stage length such as the transatlantic and the transpacific routes than on route groups with a short average stage length such as Central America and Europe. This relative economic advantage for the operations of long-haul routes is amplified by the fact that large wide-body aircraft in 1991 accounted for a high proportion of the total capacity on long-haul routes but were being used less on the route groups with *a short average stage length. The variation in average aircraft* productivity resulting from variations in average block speed and average size of aircraft is very wide. For example, the seat-kilometres per aircraft block hour in Central America, South America and Europe route groups are in each case less than one-third of the *seat-kilometres per block hour* on the North and Mid Pacific and South Pacific route groups.

Table 4-2. Aircraft operational data by route group, 1991

Route group (short title)	Average length of flight stage (km)	Average block speed (km/h)	Percentage distribution		Average aircraft productivity: available seat-kilometres per block hour (thousands)
			Narrow-body	Wide-body	
I. All world international routes	1 961	665	19	81	160
II. International route groups:					
1. North-Central America	1 320	605	54	46	111
2. Central America	661	548	98	2	79
3. North America	1 203	584	83	17	88
4. North-South America	2 275	704	26	74	155
5. South America	972	495	64	36	81
6. Europe	889	521	84	16	70
7. Middle East	890	523	44	56	94
8. Africa	949	613	54	46	90
9. Europe-Middle East	2 244	662	30	70	134
10. Europe-Africa	3 006	724	10	90	185
11. North Atlantic	4 739	751	3	97	201
12. Mid Atlantic	4 400	775	5	95	220
13. South Atlantic	3 924	769	5	95	226
14. Asia/Pacific	1 852	677	7	93	183
15. Europe-Asia/Pacific	4 324	743	4	96	229
16. North/Mid Pacific	5 733	789	2	98	263
17. South Pacific	5 186	795	3	97	261

4.6 Differences in aircraft fleet composition among route groups contribute to the differences in both aircraft and other operating costs, but mainly in the aircraft costs. The contribution to regional differences in aircraft operating costs arising from differences in aircraft mix (excluding the effects of differences in stage length, fuel prices and load factors) has been estimated and is presented in paragraphs 4.21 and 4.22.

4.7 Other operating costs as well as aircraft operating costs are of course also strongly influenced by the average length of flight stages operated in a route group. This is because certain important cost items, such as station expenses and landing charges, are primarily dependent upon the number of aircraft and passenger departures. Since the number of seat-kilometres (or passenger-kilometres) per departure increases proportionally with increasing stage length, the cost **per seat-kilometre** (or per passenger-kilometre) of station expenses and landing charges falls with increasing stage length. Estimated effects of differences in stage length on operating costs (both aircraft and other) are also presented in paragraphs 4.21 and 4.22.

Prices for aircraft fuel and oil
[factor c)]

4.8 The estimated total consumption of aircraft fuel and oil on international subsonic jet passenger routes in 1991 was about 75 billion litres, and the total cost to the airlines was some $15 billion for an average price per litre of 20.0 cents. This average price paid per litre represented a decrease of about 13 per cent over the 1990 average price of 23.0 cents per litre. In 1991, fuel represented about 13 per cent of the total passenger operating costs compared with some 15 per cent in 1990.

Table 4-3. Estimated unit fuel prices and airport charges by region, 1991 (international scheduled services)

Area[1]	Aircraft fuel and oil prices (cents/litre)	Landing and associated airport charges (dollars/departed tonne)[2]
World	20.0	9.5
North America	17.2	4.2
Central America/Caribbean	22.4	4.0
South America	22.9	5.3
Europe	19.5	16.6
Middle East	21.2	5.3
Africa	28.1	7.0
Asia/Pacific	21.7	8.2

1. More detailed descriptions of areas and route groups may be found in Appendix 3 on the reverse of the revenue and cost questionnaire.
2. Tonnes of aircraft maximum take-off weight.

4.9 Detailed estimates have been made of the average prices of fuel purchased in the different regions of the world (Table 4-3) and of the average prices of fuel consumed on the various route groups (Table 4-4). As shown in Table 4-3 on a regional basis the price per litre of fuel in 1991 ranged from about 17 cents in North America to some 28 cents in Africa (some 65 per cent higher than the price paid in North America). Between 1990 and 1991 changes in fuel prices varied from region to region, from a decrease of almost 8 per cent in the Middle East to one of about 17 per cent in North America.

Table 4-4. Estimated unit fuel prices and airport charges by route group, 1991 (international scheduled services)

Route group (short title)	Aircraft fuel and oil prices (cents/litre)	Landing and associated airport charges (dollars/ departed tonne)[1]
I. All world international routes	20.0	9.5
II. International route groups:		
1. North-Central America	19.8	3.6
2. Central America	25.6	2.9
3. North America	18.3	3.4
4. North-South America	20.6	4.7
5. South America	22.9	5.4
6. Europe	20.6	19.0
7. Middle East	19.4	4.3
8. Africa	30.6	7.0
9. Europe-Middle East	20.6	9.6
10. Europe-Africa	23.6	10.0
11. North Atlantic	17.9	6.6
12. Mid Atlantic	21.2	8.5
13. South Atlantic	22.0	8.3
14. Asia/Pacific	22.3	7.8
15. Europe-Asia/Pacific	20.6	9.1
16. North/Mid Pacific	19.3	7.4
17. South Pacific	18.5	6.0

1. Tonnes of aircraft maximum take-off weight.

4.10 *On a route group basis (Table 4-4) the estimated fuel prices range from a low of 17.9 cents* per litre for routes across the North Atlantic to a high of 30.6 cents per litre for routes within Africa. Comparing the two sets of fuel price estimates in Tables 4-3 and 4-4, both of which are derived from the same data sources, it may be seen that the differential between the average prices paid for fuel for international services carried out entirely within Africa (30.6 cents per litre) and those for all fuel uplifted in Africa for international services to, from and within that region (28.1 cents per litre) are significantly higher than the differential for the other regions. This difference was less than the one shown in previous years. Nevertheless, further analysis shows that airlines from outside this region have generally paid lower prices for fuel in the region concerned than airlines based in the region, possibly as a result of favourable terms of bulk purchasing arrangements covering a wider network of services.

Airport and associated charges
[factor d)]

4.11 Airport charges in 1991 represented about four per cent of the total costs for international passenger operations. The basis on which these charges are levied varies from airport to airport but aircraft gross weight is the predominant element and a broad and simple comparison of the levels of airport charges in different parts of the world can be based on dollars paid per tonne of aircraft maximum take-off weight. Using this measure, estimated average airport charges in different regions of the world are shown in Table 4-3. The table shows that the world average was $9.50 per tonne and that the average charges in regions ranged from $4.00 in Central America/Caribbean to $16.60 in Europe. En-route facility charges are not generally included in these estimates because of their more limited significance (about two per cent of total costs) and because of the margin of uncertainty associated with their estimation on a regional basis.

4.12 Estimates of landing and associated airport charges have also been made on a route group basis and are shown in Table 4-4. The range of these estimates for route groups is from $2.90 per tonne for traffic within and between Central America and the Caribbean to $19.00 for traffic within Europe.

Load factor
[factor e)]

4.13 A large part of the total costs of operating a flight on a scheduled air service is independent of, or only moderately affected by, the number of passengers actually carried on the flight. Since, as shown in Table 3-1, the passenger load factors achieved in 1991 varied significantly among route groups, from a low of 55 per cent on routes within Africa to a high of 70 per cent on routes across the North Atlantic and the South Pacific, they had a significant influence on differences in total operating costs per passenger-kilometre. Estimated effects of differences in load factor on operating costs for each route group are presented in paragraphs 4.21 and 4.22.

Other causes of regional differences in costs

4.14 Among the factors that led to regional differences in the total cost of passenger operations in 1991, the varying aircraft operating costs, including the effect of varying prices of fuel, have been discussed above. The effect of varying stage lengths and load factors has been assessed for both aircraft operating costs and other cost items but, with the exception of variations in airport charges, other effects of differences in non-aircraft cost items have not been analysed. The remaining cost items include "station expenses", "passenger services", "commission", "ticketing, sales and promotion" and "general, administrative and miscellaneous" and together accounted for some 51 per cent of the total costs for international passenger operations in 1991. Some of these cost items for passenger operations show significant differences among route groups even after extraction of any stage length and load factor effects. A general commentary concerning these items and their variation is given below.

4.15 ***Station expenses*** (column 5 in Table 3-2) relate mainly to the servicing of aircraft and passengers at airports. While they vary greatly among route groups, from 0.5 to 3.3 cents per passenger-kilometre, some of the variation is due to the effects of differences in stage length. If this effect is extracted from station expenses, routes in local South America show the lowest costs per passenger while routes across the North Atlantic show the highest costs.

4.16 ***Passenger service costs*** (column 6 in Table 3-2) relate primarily to cabin services provided in flight. In 1991 passenger service costs represented about 14 per cent of total passenger operating costs.

Table 4-5. Contributions to differences in costs amongst route groups, 1991

Route group (short title)	World average total passenger operating costs (1)	Effect of aircraft mix on direct operating costs (2)	Effect of stage length and average block speed (3)	Effect of aircraft fuel and oil prices (4)	Effect of landing and associated airport charges (5)	Effect of load factor (6)	Sum of effects in columns 2-6 (7)	Effect of other factors (8)	Actual total passenger operating costs: columns 1+7+8 (9)
	(cents per passenger-kilometre)								
I. All world international routes	9.7	–	–	–	–	–	–	–	9.7
II. International route groups:									
1. North-Central America	9.7	0.6	1.1	0.0	−0.2	0.6	2.1	−2.0	9.8
2. Central America	9.7	1.4	3.6	0.4	−0.3	1.1	6.2	−3.6	12.3
3. North America	9.7	0.8	1.5	−0.1	−0.2	0.4	2.4	−2.2	9.9
4. North-South America	9.7	0.0	−0.4	0.0	−0.2	0.5	−0.1	−1.0	8.6
5. South America	9.7	0.4	2.9	0.2	−0.2	0.8	4.1	−1.3	12.5
6. Europe	9.7	1.6	2.9	0.0	0.4	2.1	7.0	5.1	21.8
7. Middle East	9.7	0.5	2.8	0.0	−0.2	1.0	4.1	0.3	14.1
8. Africa	9.7	1.0	1.8	0.7	−0.1	2.0	5.4	−0.4	14.7
9. Europe-Middle East	9.7	0.4	−0.2	0.0	0.0	0.1	0.3	1.0	11.0
10. Europe-Africa	9.7	−0.2	−0.8	0.2	0.0	0.3	−0.5	1.1	10.3
11. North Atlantic	9.7	−0.2	−1.3	−0.1	0.0	−0.3	−1.9	0.1	7.9
12. Mid Atlantic	9.7	−0.4	−1.4	0.1	0.0	−0.1	−1.8	0.4	8.3
13. South Atlantic	9.7	−0.5	−1.3	0.1	0.0	0.2	−1.5	1.4	9.6
14. Asia/Pacific	9.7	−0.1	0.0	0.1	−0.1	−0.1	−0.2	−0.3	9.2
15. Europe-Asia/Pacific	9.7	−0.4	−1.2	0.0	0.0	−0.1	−1.7	0.1	8.1
16. North/Mid Pacific	9.7	−0.5	−1.6	0.0	−0.1	−0.2	−2.4	0.7	8.0
17. South Pacific	9.7	−0.4	−1.6	−0.1	−0.1	−0.3	−2.5	−0.3	6.9

The differences in their level among the route groups, from 1.0 to 2.8 cents per passenger-kilometre, primarily reflect differences in salary, service levels and utilization of cabin crew.

4.17 ***Commission*** (column 7 in Table 3-2) is paid by each airline to travel agents and other airlines for the sale of passenger tickets. Commission is dependent on the extent to which airlines' sales are handled by agents in different parts of the world. However, because the commission is usually a certain percentage of the price of the ticket the variation in this cost item, from 0.7 to 2.0 cents per passenger-kilometre, is also related to the variation in average revenue per passenger-kilometre.

4.18 ***Ticketing, sales and promotion*** (column 8 in Table 3-2) is an item for which the level is largely determined by decision-making within individual airlines. In 1991 this item represented almost 9 per cent of passenger costs. The variation among the route groups, from 0.6 to 2.3 cents per passenger-kilometre, reflects differing competitive situations and the extent to which airlines handle their own sales in the various route groups.

4.19 Commission, ticketing, sales and promotion together reflect the over-all cost of selling passenger tickets. Depending on the route group, between 17 and 30 per cent of total passenger revenues are used to defray this cost.

4.20 ***General, administrative and miscellaneous expenses*** (column 9 in Table 3-2) vary from 0.4 to 1.2 cents per passenger-kilometre. This partly reflects variations in the organizational structure and the accounting practices of airlines in different parts of the world, but also variations in salary levels and staff productivity among regions. Additionally, economies of scale may be an important factor affecting variations in this cost item as large airlines, which tend to have lower administrative overheads per passenger-kilometre performed than smaller airlines, play a greater role on some route groups than on others. In recent years, administrative costs, which include gains or losses due to changes in exchange rates, have been heavily influenced by fluctuations in exchange rates.

Summary of causes of regional differences in costs

4.21 The effects of the factors described in paragraphs 4.3 to 4.20 on the cost levels for route groups are shown in Table 4-5. Column 1 of that table shows against each route group the world average cost per passenger-kilometre in 1991, which was 9.7 cents. Columns 2 through 6 show the deviations from this world average that may be attributed to each of the individually assessed factors described in paragraphs 4.3 to 4.13 above, and column 8 shows the aggregate effect of the "other factors" (some other factors were described in summary form in paragraphs 4.14 to 4.20). Column 9 shows the resulting actual total costs per passenger-kilometre for each route group.

4.22 Comparing the various factors identified in columns 2 to 6 of Table 4-5 it will be noted that each of them contributed significantly to differences from the world average cost per passenger-kilometre. On 13 out of the 17 route groups, "stage length and average block speed" was the most important single factor, on 2 of the other 4 route groups "load factor" was the most important single factor, but neither of them was the consistently dominant cause. On the remaining route groups, in one case aircraft mix was the dominant factor while in the other case there were no single dominant factors. Also, as may be seen by comparing column 7 (the sum of the effects in columns 2 to 6) with column 8, an important proportion of the differences in route group costs from the world average was due to the "other factors" which do not lend themselves to precise analysis.

Appendix 1
DATA SOURCES AND COVERAGE

Sources of the data

1. Primary sources of information for this study were two questionnaires which were dispatched (under cover of State Letter EC 2/20.3.2-92/33 of 5 June 1992) to all Contracting States to be filled out with respect to their international carriers. One questionnaire sought information on scheduled and non-scheduled passenger, freight, mail and incidental revenues for each route group, together with corresponding volumes of traffic and capacity. Replies to this questionnaire were received with respect to 85 States. The second questionnaire sought information on costs for international scheduled passenger airlines, and replies were received with respect to 80 States. Facsimiles of the two questionnaires and a list of States for which replies were received are given in Appendix 3.

2. Another important source of information as far as scheduled operations were concerned was a computer analysis carried out by the ICAO Secretariat of timetable material obtained from the Reed Travel Group, publishers of the *ABC World Airways Guide* and the *ABC Air Cargo Guide*. The data obtained from this analysis were, for each and every airline and aircraft type operating in each of the route groups, the number of departures, aircraft block hours and distance flown. In addition, research was carried out into the operating characteristics of aircraft types and sub-types, with resulting data on average number of seats (combination aircraft), fuel consumption per block hour (as a function of stage length), maximum take-off weight, payload and volumetric capacity. This information was related to the basic data to provide a bank of operating statistics for each route group and for each geographical area of operation within each route group, as well as aggregate statistics for each area and for the world as a whole.

3. A wide range of supplementary information sources was used, in particular data on airline traffic, traffic by flight stage, on-flight origin and destination traffic, fleet and personnel, and airline financial data regularly filed by Contracting States on Air Transport Reporting Forms and published in the ICAO *Digest of Statistics*.

Coverage of the data

4. For scheduled services, traffic, capacity and other operational data were derived both from the questionnaires and from the timetable material, supplemented by material from the regular statistical reports to ICAO, and may be considered as fully comprehensive of all international operations. Revenue and cost data originate essentially from the questionnaires, supplemented by national publications or other suitable sources of financial data where available; in the case of passenger traffic available revenue and cost data were adapted according to operational data to render them representative of all international operations (see Appendix 2). In the case of non-scheduled traffic, the sole source of both operational and financial data was the responses to the questionnaires, and the results shown in this study represent only these responses.

5. The study was based on revenue data obtained for 103 scheduled airlines (including 7 all-cargo airlines) and 12 other carriers, and on cost data for 85 scheduled passenger airlines.

6. The number of airlines and the coverage of international scheduled passenger traffic represented by revenue and cost data are shown in Table A1-1 by region of airline registration. The over-all representation in terms of available seat-kilometres is 87 per cent for revenue data and 85 per cent for cost data. Representation of each of the African and Middle East regions in 1991 was significantly lower than for the other regions.

7. For each route group, the number of airlines and the percentage of traffic represented by these airlines are shown in Table A1-2. The differences in the over-all representation shown between Tables A1-1 and A1-2 occur because a major South American carrier reported cost and revenue data for all its international routes except those operated within South America. In terms of available seat-kilometres, representation of revenue data is 70 per cent or above for 11 of the 17 route groups, whereas for cost data it is 70 per cent or above only for 10 route groups. However, for routes in local South America, local Middle East and local Africa representation was 50 per cent or below, hence cost and revenue figures for these route groups must be interpreted with a certain degree of caution.

8. The coverage of revenue data for non-scheduled passenger operations is shown in Table A1-3 and the coverage of revenue data for scheduled freight and mail services is shown in Table A1-4.

REPRESENTATIVE NATURE OF REVENUE AND COST DATA FOR SCHEDULED PASSENGER OPERATIONS, 1991

Table A1-1. Representation by ICAO region of airline registration

Region	International scheduled available seat-kilometres (millions)	Revenue data represent			Cost data represent		
		Number of airlines	Available seat-kilometres		Number of airlines	Available seat-kilometres	
			No. (millions)	% of total		No. (millions)	% of total
All	1 305 096	96	1 133 624	87	84	1 104 645	85
Africa	*52 678*	*12*	*25 887*	*49*	*11*	*25 805*	*49*
Asia/Pacific	348 864	20	317 048	91	19	316 418	91
Europe	449 203	30	403 113	90	23	377 534	84
Middle East	54 425	4	30 595	56	3	28 786	53
North America	316 115	10	293 078	93	10	293 078	93
Central America/Caribbean	32 312	7	23 503	73	7	23 503	73
South America	51 499	13	40 400	78	11	39 521	77

Source: ICAO Air Transport Reporting Form A-1.

Table A1-2. Representation by international route group

Route group (short title)	Revenue data represent		Cost data represent	
	Number of airlines	Percentage of total scheduled seat-kilometres	Number of airlines	Percentage of total scheduled seat-kilometres
I. All world international routes	96	85	84	83
II. International route groups:				
1. North-Central America	11	84	11	84
2. Central America	6	54	6	54
3. North America	12	90	12	90
4. North-South America	17	84	15	82
5. South America	8	52	7	50
6. Europe	30	88	25	82
7. Middle East	5	49	3	43
8. Africa	10	42	9	41
9. Europe-Middle East	26	65	20	53
10. Europe-Africa	29	77	26	69
11. North Atlantic	37	88	33	87
12. Mid Atlantic	11	75	11	75
13. South Atlantic	14	94	14	94
14. Asia/Pacific	22	82	20	82
15. Europe-Asia/Pacific	43	89	37	86
16. North/Mid Pacific	17	92	17	92
17. South Pacific	8	65	7	63

Table A1-3. Representative nature of revenue data for non-scheduled passenger operations, 1991, by ICAO region of carrier registration

Region	International non-scheduled passenger-kilometres performed (millions)			Revenue data represent								
				All carriers			International scheduled airlines			Other carriers		
	By all carriers	By international scheduled airlines	By other carriers	Number of carriers	Pass-km performed No. (millions)	Pass-km performed % of total	Number of carriers	Pass-km performed No. (millions)	Pass-km performed % of total	Number of carriers	Pass-km performed No. (millions)	Pass-km performed % of total
All	150 732	71 367	79 365	61	55 492	37	50	18 267	26	11	37 225	47
Africa	2 975	2 975	*	3	975	33	3	975	33	–	–	–
Asia/Pacific	2 951	2 932	19	13	1 152	39	13	1 152	39	–	–	–
Europe	117 855	50 225	67 630	26	45 385	39	15	8 160	16	11	37 225	55
Middle East	2 540	2 208	331	3	735	29	3	735	33	–	–	–
North America	22 314	10 964	11 350	11	6 912	31	11	6 912	63	–	–	–
Central America/ Caribbean	1 585	1 585	*	3	105	7	3	105	7	–	–	–
South America	512	478	34	2	227	44	2	227	48	–	–	–

* Less than 0.5 million.

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

Table A1-4. Representative nature of revenue data for scheduled freight and mail services, 1991, by ICAO region of airline registration

Region	International scheduled freight tonne-km performed (millions)	Freight revenue data represent			International scheduled mail tonne-km performed (millions)	Mail revenue data represent		
		Number of airlines	Tonne-km performed			Number of airlines	Tonne-km performed	
			No. (millions)	% of Total			No. (millions)	% of total
All	46 423	98	40 631	88	2 209	89	2 089	95
Africa	1 021	11	529	52	36	9	21	57
Asia/Pacific	15 711	21	13 660	87	518	20	483	93
Europe	16 987	29	16 270	96	797	28	780	98
Middle East	2 163	4	820	38	57	4	30	52
North America	8 316	11	7 565	91	739	11	728	99
Central America/Caribbean	281	6	154	55	11	6	5	39
South America	1 945	16	1 633	84	52	11	43	84

Source: ICAO Air Transport Reporting Form A-1.

Appendix 2
METHOD OF ANALYSIS AND MARGINS OF UNCERTAINTY

Method of analysis

1. ***General.*** Data sources in general are discussed in Appendix 1. All airline financial data were initially adjusted where necessary to represent the calendar year 1991, and converted where necessary from local currency to United States dollars. For currency conversions, use was made of the exchange rates provided by States in their reply to the questionnaires. In those cases where an exchange rate was not supplied, the rate used was the average "IATA Clearing House Five-Day Monthly Rate" for 1991.

2. Prior to detailed analysis all financial and operational data were verified (a) as to the mutual consistency and as to consistency with data for previous years, (b) with information provided on statistical reporting forms regularly submitted to ICAO, and (c) with data obtained from a computer analysis of published timetable material (see Appendix 1).

3. ***Analysis of available revenue data.*** Scheduled and/or non-scheduled passenger, freight and mail revenues for each international route group, together with corresponding volumes of traffic and capacity, as well as incidental revenues attributable directly to international scheduled services were obtained for individual carriers directly from the revenue questionnaires designed for this purpose (facsimiles of the revenue and the cost questionnaires are included in Appendix 3). This information for individual carriers was aggregated for each route group to obtain weighted average revenues per passenger-kilometre and per seat-kilometre (for passenger traffic) or per tonne-kilometre performed (for freight and mail traffic). In the case of scheduled operations the data for individual airlines, and hence the average unit revenues, include allowance for discounts, pro-rates, etc., but generally exclude deductions for commission payments.

4. ***Analysis of available cost data.*** Cost data are obtained and analysed only for international scheduled passenger airlines. While most scheduled (and non-scheduled) carriers maintain revenue and traffic data on a route by route and/or route group basis, far fewer maintain cost data in a correspondingly disaggregated form. Hence, in order to present data which are generally representative of scheduled passenger airline operations in each region of the world, and at the same time minimize the reporting burden on States and their airlines, a questionnaire was designed in which the requirement for disaggregation of system-wide operating costs was both sparing and in line with practices followed by a majority of airlines. The cost data obtained for individual airlines through this questionnaire were subsequently allocated by the Secretariat among route groups (as necessary, that is where an airline operated on more than one route group) using the analysis of published timetable material.

5. The cost data obtained for an individual airline, and the procedures used for allocating these costs among the route groups on which the airline operated, may be divided into three broad categories, as shown in Table A2-1: firstly (A), operating costs which for a given airline and a given aircraft type may, for this purpose, be considered as independent of where the aircraft is flying; secondly (B), operating costs which are significantly related both to aircraft type and to geographical area of operation; and thirdly (C), operating costs and pertinent non-operating items which may be related only in part to aircraft type or to the region in which they are incurred, but which are related significantly to the volume of traffic or the volume of capacity in each route group.

Table A2-1. Procedures used to allocate individual airline costs among route groups

Category of costs	Cost item (see note 1)	Airline data input to study	Cost alloation criteria
A. Cost related primarily to aircraft type	I.1 Flight operation expenses, excluding fuel and oil costs I.2 Aircraft maintenance and overhaul expenses I.3 Aircraft depreciation and amortization costs I.4 Interest charges on aircraft	System-wide costs and system-wide block hours flown for each aircraft type operated	I.1-I.4 Number of block hours flown by each aircraft type on each route group
B. Costs related significantly both to aircraft type and geographical area of operation	II.1 Aircraft fuel and oil costs II.2 Landing and associated airport charges II.3 En-route facility charges II.4 Other station expenses	Either: a) costs by geographical area of operation, or b) costs by route group (no allocation to route group necessary), or c) costs by aircraft type	II.1 Fuel consumption by each aircraft type in each area of operation II.2 Maximum take-off weight times number of departures for each aircraft type in each area of operation II.3 Maximum take-off weight times number of block hours flown for each aircraft type in each area of operation II.4 Maximum payload times number of departures for each aircraft type in each area of operation
C. Costs related significantly to volume of traffic or volume of capacity	III.1 Passenger service costs III.2 Commission payments III.3 Other ticketing, sales and promotion costs III.4 General and administrative expenses III.5 Miscellaneous operating expenses IV.1 Balance of miscellaneous non-operating items (excluding payments from public funds and balance of income from affiliated companies)	System-wide costs	III.1 Number of seat-hours on each route group III.2 Passenger and freight revenue earned on scheduled services from each route group III.3 Total revenue earned from each route group III.4 to IV.1 Number of tonne-kilometres performed in each route group

1. Cost item references are those used in the cost questionnaire (see Appendix 3). The items themselves are described in the Reporting Guidelines on the reverse of the cost questionnaire.

6. Costs in the *first category (A)* were obtained from the data for each airline as an average system-wide cost per aircraft block hour for each aircraft type used in international scheduled service. The costs for each route group were calculated according to the number of block hours flown by each aircraft type operated by the airline on that route group.

7. Costs in the *second category (B)* were recorded for each airline by route group or by geographical area (or in a few instances by aircraft type). Where recorded by area or by aircraft type, data were adapted to obtain corresponding data by route group using appropriate operational criteria (such as consumption in the case of "aircraft fuel and oil"). The relationships between route groups, geographical areas and aircraft types in terms of operational data were available from the computer analysis of timetable material.

8. Costs in the *third category (C)* were recorded as system-wide totals for the operations of each airline. These costs were disaggregated into route group costs using a suitable allocation parameter for each cost item. The allocation parameter devised for each item bears a direct or indirect relationship with the volume of traffic or capacity in each route group. In the case of "Commission payments" and "Other ticketing, sales and promotion costs", the allocation parameter used is the total revenue earned from each route group, thereby including effects both from traffic and from regional differences in revenue yields (and hence regional differences in ticketing, sales and promotion costs).

9. For some airlines, cost data within the three categories were reported relating to domestic operations and/or international non-scheduled operations as well as to international scheduled operations. Such costs associated with domestic and non-scheduled operations were subtracted using the same allocation procedures as were used to distribute costs among route groups.

10. As far as data for individual airlines were concerned, total costs for the scheduled international passenger flights in each route group were estimated by summing the itemized costs allocated to the route group. Finally, costs allocable to the carriage of freight and mail on passenger flights were deducted from these total costs to arrive at passenger costs. For this purpose it was assumed that the cost of carriage of freight and mail on passenger and combination aircraft on a route group was equal to the freight and mail revenue from operations of these aircraft.

11. ***Estimates of revenues and costs for airlines for which financial data were not available.*** The procedures described above lead to the production of total revenues and (for international scheduled passenger traffic) total costs on each route group by airline region of registration for all those carriers for which the basic financial data were available. In most cases, this financial database did not include all carriers operations. However, for scheduled passenger traffic, estimated revenues and costs presented in this study are formulated to cover all airlines operating on each route group.

12. In the case of revenues the reported average revenue yield per passenger-kilometre for airlines registered in the same region within each route group has been applied to the total revenue passenger-kilometre for all airlines registered in that region operating on the route group.

13. In the case of costs the estimates for non-reported airlines have been based on cost data for reported airlines from the same region of registration for the route group, but also take into account differences in the operating characteristics of the two groups of airlines concerned (including differences in load factors). With respect to the costs in category A (see Table A2-1), the average costs per block hour for the aircraft of airlines for which cost data were available were applied to the hours flown by the same aircraft types by non-reported airlines from the same region of registration, thus taking into account differences in aircraft fleet, in block speed and in seating configuration. Costs in the categories B and C were similarly estimated on the basis of criteria parallel to those used in allocating costs of individual airlines among route groups.

14. For some route groups where airlines of a particular region have a very low representation (such as Africa and the Middle East), the grossing-up process for revenues and costs was adjusted to take into account the revenues and costs of major non-reported airlines on the basis of data provided for previous studies as well as data regularly collected for ICAO Digests of Statistics.

Margins of uncertainty

15. ***General.*** It is important to recognize that the revenue and cost data presented in this Circular are not perfectly defined quantities, but involve margins of uncertainty. Such margins of uncertainty are inherent in any presentation of airline financial data which covers a multiplicity of currencies, which involves disaggregation of system-wide revenues and costs, or which has an incomplete database. Hence an important feature of the method used in this series of studies has been to identify and evaluate the various sources of uncertainty for the purpose of establishing the degree of precision in the published data and hence the constraints on drawing conclusions from these data. The evaluations concerned were carried out by means of statistical analysis of detailed airline data and by means of tests as to the sensitivity of the published data to the procedures used in the study. The resulting assessments of margins of uncertainty in average unit revenues, average unit costs and average revenue/cost ratios published in this study for scheduled passenger traffic in 1991 are presented below.

16. ***Estimates of unit revenues.*** The margin of uncertainty on the estimated unit revenues for a route group arises from limitations on the quality of reported data, from exchange rate fluctuations and, for scheduled passenger traffic, from the assumption that the average yield for non-reported airlines is the same as that for reported airlines on the same route group. An analysis was carried out to evaluate each of these sources of uncertainty and their cumulative effect, thus producing composite margins of uncertainty for the various route groups. The conclusion was that with the exception of routes across the South Pacific, where there was a significant variation in unit revenues among the reporting carriers, the estimated scheduled passenger revenue per passenger-kilometre for almost all the route groups presented can be relied upon to ±6 per cent. However, caution should be exercised when interpreting the revenue (and cost) data for routes in local South America, local Middle East and local Africa due to the relatively low representation in those route groups. A significantly narrower margin of uncertainty than ±6 per cent applies for those route groups where the representation was relatively high. On a global bases, taking into account all route groups as a whole, the margin of uncertainty is reduced by compensatory effects and by scale, and is estimated at ±3 per cent.

17. ***Estimates of unit costs.*** The estimates of unit passenger costs for a route group contain similar elements of uncertainty as those for passenger revenues, plus further elements which arise from the need to allocate costs among route groups according to standardized procedures. These additional sources of uncertainty arise because:

a) the generic nature of some cost items (for example general administrative costs) makes their allocation among route groups a matter of convention; and

b) even for those cost items which are region or route-specific, the standardized allocation procedures do not take into account the detailed conditions under which individual airlines operate.

18. As for the revenue data, a composite margin of uncertainty was developed in respect of the average unit costs for each route group and for all route groups together. With the exception of routes in local Africa, where there was a significant variation in unit costs among the reporting carriers, the margin of uncertainty on the estimated scheduled passenger costs per passenger-kilometre for all the other route groups presented is considered to be within ±10 per cent. Route groups with high representation show a somewhat

narrower margin of uncertainty. On a global basis, taking into account all route groups as a whole, the margin of uncertainty in the average costs per passenger-kilometre is estimated at ±5 per cent.

19. On route groups where the margin of uncertainty approaches ±10 per cent the contribution of different sources of uncertainty is approximately as follows:

Sources of uncertainty	*Relative contribution to margin of uncertainty*
Incomplete cost database	3
Generic nature of certain costs and use of standardized allocation procedures	3
Fluctuations in currency exchange rates	2
Other (primarily imperfections in reported data)	2
All	10

20. Much of the uncertainty arising from the generic nature of certain costs is inherent and cannot be influenced (see paragraph 17), and little can be done to reduce the uncertainty arising from fluctuations in currency exchange rate. A major factor in these studies is therefore getting as much coverage of financial data as possible, while at the same time making efforts to improve the quality of reported data.

21. All the above estimates of uncertainty apply only to over-all average cost data (as presented in Chapter 3, Table 3-1). Estimates of individual elements making up the over-all cost are in a number of cases subject to wider margins of uncertainty.

22. ***Estimates of revenue/cost ratios.*** The estimated ratios of revenues to costs have margins of uncertainty which vary from route group to route group depending on the margins of uncertainty in the estimated revenue and cost data. It should be noted, however, that the uncertainties in the revenue and the cost figures for a route group are to some extent inter-dependent; in other words, if the revenue on a route group is over-estimated, the cost figure is also probably over-estimated. This circumstance reduces the margin of uncertainty in the revenue/cost ratios compared with those for either the revenue data alone or the cost data alone. The composite margin of uncertainty for the revenue/cost ratio for individual route group in this study is estimated at ±5 per cent, and for all the route groups together it is estimated at ±2.5 per cent.

Appendix 3
QUESTIONNAIRES RELATING TO REVENUES AND COSTS

I. Facsimiles of questionnaires and attachments

QUESTIONNAIRE ON REVENUES OF INTERNATIONAL SCHEDULED AND NON-SCHEDULED AIR CARRIERS

(Reporting Guidelines and Route Group Descriptions Overleaf)

CARRIER NAME: _____

CALENDAR PERIOD:

12 MONTHS FROM _____ TO _____

REPORTING CURRENCY (US$ OR NATIONAL): _____

EXCHANGE RATE BETWEEN NATIONAL CURRENCY AND THE US DOLLAR DURING PERIOD: 1 US$ = _____

	TOTAL ALL SERVICES (DOMESTIC PLUS INTERNATIONAL)	TOTAL DOMESTIC SERVICES	TOTAL INTERNATIONAL SERVICES (TOTAL FOR ROUTE GROUPS 1 TO 17)	INTERNATIONAL SERVICES BY ROUTE GROUP															
				1 Between North America and Central America/Caribbean	2 between and within Central America and the Caribbean	3 Between Canada, Mexico and the United States	4 Between North America/Central America/Caribbean and South America	5 Local South America	6 Local Europe	7 Local Middle East	8 Local Africa	9 Between Europe and Middle East	10 Between Europe/Middle East and Africa	11 North Atlantic	12 Mid Atlantic	13 South Atlantic	14 Local Asia/Pacific	15 Between Europe/Middle East/Africa and Asia/Pacific	16 North and Mid Pacific	17 South Pacific
SECTION I - SCHEDULED SERVICES																			
I.1 Revenue																			
a) passenger traffic (including excess baggage)																			
b) freight traffic																			
c) mail traffic																			
d) other																			
I.2 Corresponding Volume of Traffic and Capacity																			
a) passenger-kilometres (millions)																			
b) seat-kilometres (millions)																			
c) freight tonne-kilometres performed (millions)																			
d) mail tonne-kilometres performed (thousands)																			
e) available tonne-kilometres (millions)																			
I.3 All-Cargo Services Only (included in I.1 and I.2 above)																			
a) revenue (total)																			
b) tonne-kilometres performed (millions)																			
SECTION II - NON-SCHEDULED OPERATIONS																			
II.1 Revenue																			
a) passenger traffic																			
b) freight traffic																			
II.2 Corresponding Volume of Traffic and Capacity																			
a) passenger-kilometres (millions)																			
b) seat-kilometres (millions)																			
c) freight tonne-kilometres performed (millions)																			
d) available tonne-kilometres (millions)																			

Remarks (Include description of any deviations from Reporting Guidelines and Route Group Descriptions overleaf.)

REPORTING GUIDELINES

GENERAL

a) This questionnaire is to be returned completed by ICAO Contracting States for each of their major international scheduled and non-scheduled air carriers (including any all-cargo carriers). The material provided will not be made public in such a way as to permit identification of individual operators. Information provided should be the total amount for a 12-month period as close as possible to the calendar year specified in the covering State Letter, with the period being identified in the space provided. It is recognized that, in order for your reply to reach ICAO by the date indicated in the State Letter, final audited financial data may not be available, but preliminary data are acceptable.

b) Data for all-cargo aircraft operations should be included in the relevant sections of the questionnaire. Data for scheduled services with such aircraft should be included in Items I.1 and I.2, and specified under I.3 if possible.

c) Financial data may be provided either in terms of national currency or in terms of U.S. dollars. In either case the weighted average annual exchange rate used or to be applied to convert national currency into U.S. dollars should be specified in the space provided.

d) A brief description of each financial data item is given below; for more detailed definitions see the Instructions for completion of ICAO Air Transport Reporting Form EF-1, for airline Financial Data. For definitions of traffic and capacity data items see ICAO Air Transport Reporting Form A-1 for airline Traffic data.

e) Descriptions of the route groups, which are based on those used by IATA's Cost Committee, are also given below, followed by guidelines on allocating data amongst them.

SECTION I - SCHEDULED SERVICES

For Items I.1 a) to I.1 c) and I.3 a) report gross revenues related to scheduled flights before capacity equalization payments arising from pooled services and from the sale of own capacity to other carriers.

For Item I.1 d) Other revenue is intended to include on a net basis capacity equalization payments arising from pooled services and from the sale of own capacity to other carriers; and on a gross basis (with related expenses reported under the relevant expense item, indicate where different) incidental revenues accruing from air transportation services such as revenues from passengers paying less than 25 per cent of the normal applicable fare; commissions received on sales of transportation on other carriers; "no-show" and cancellation fees. Exclude revenue accruing from the provision of services other than for air transportation, such as for surface transportation; food services; service and maintenance sales; handling services for third parties; and property.

SECTION II - NON-SCHEDULED OPERATIONS

Include revenue derived from all non-scheduled flights performed for remuneration, including empty flights related thereto, when the responsibility for the performance of transportation is that of the carrier reported.

DESCRIPTIONS OF ROUTE GROUPS

1. Between North America and Central America/Caribbean

   Includes routes between on the one hand Canada and/or the United States (including Alaska and Hawaii) and on the other hand Central America and the Caribbean. Routes between the United States and Puerto Rico/Virgin Islands are considered domestic and are excluded. Central America/Caribbean is defined as the geographical area covered by route group 2 below but excluding Mexico.

2. Between and within Central America and the Caribbean

   Includes routes between or among the Bahamas, Belize, Bermuda, Costa Rica, El Salvador, Guatemala, Honduras, the islands of the Caribbean Sea (including Puerto Rico and the Virgin Islands), Mexico, Nicaragua and Panama.

3. Between Canada, Mexico and United States

   Includes routes between or among the above States. The United States includes Alaska and Hawaii but excludes Puerto Rico and the Virgin Islands.

4. Between North America/Central America/Caribbean and South America

   Includes routes between the geographical areas defined on the one hand by route group 1 and/or Mexico and on the other hand by route group 5 ("Local South America").

5. Local South America

   Includes routes between or among the following States: Argentina, Bolivia, Brazil, Chile, Colombia (including San Andres Islands), Ecuador, Falkland Islands (Malvinas), French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela.

6. Local Europe

   Includes routes between or among the States of geographical Europe, Algeria, Azores, Canary Islands, Greenland, Iceland, Madeira, Malta, Morocco, Tunisia and Turkey.

7. Local Middle East

   Includes routes between or among the following States: Bahrain, Cyprus, Democratic Yemen, Egypt, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Emirates and Yemen.

8. Local Africa

   Includes routes between or among the States of continental Africa and offshore islands, but excluding Algeria, Azores, Canary Islands, Egypt, Madeira, Malta, Morocco, Sudan and Tunisia.

9. Between Europe and Middle East

   Includes routes between the two geographical areas defined by route group 6 ("Local Europe") and route group 7 ("Local Middle East") respectively.

10. Between Europe/Middle East and Africa

    Includes routes between on the one hand the geographical areas defined by route group 6 ("Local Europe") and/or route group 7 ("Local Middle East") and on the other hand the geographical area defined by route group 8 ("Local Africa").

11. North Atlantic

    Includes routes between on the one hand Canada and/or the United States (including Alaska and Hawaii) and on the other hand the geographical areas defined by IATA Tariff Conference 2 ("Local Europe" and/or "Local Middle East" and/or "Local Africa").

12. Mid Atlantic

    Includes routes between on the one hand gateway points in the geographical areas defined by route group 2 and/or route group 5 ("Local South America") but north of Rio de Janeiro and on the other hand the geographical areas defined by IATA Tariff Conference 2 ("Local Europe" and/or "Local Middle East" and/or "Local Africa").

13. South Atlantic

    Includes routes between on the one hand Rio de Janeiro or any other gateway south thereof in route group 5 ("Local South America") and on the other hand the geographical areas defined by IATA Tariff Conference 2 ("Local Europe" and/or "Local Middle East" and/or "Local Africa").

14. Local Asia/Pacific

    Includes IATA Tariff Conference 3, that is international routes within Asia to the east of the Islamic Republic of Iran and of the Ural Mountains, Australia, New Zealand, Papua New Guinea, the islands of the Pacific Ocean excluding the Hawaiian Islands, Midway and Palmyra.

15. Between Europe/Middle East/Africa and Asia/Pacific

    Includes routes between the geographical areas defined by IATA Tariff Conference 2 on the one hand and that defined by IATA Tariff Conference 3 on the other hand.

16. North and Mid Pacific

    Includes routes via the North and Central Pacific Ocean between on the one hand points in the Americas (that is IATA Tariff Conference 1) and on the other hand Asia and/or the islands adjacent thereto (that is IATA Tariff Conference 3 except Australia, New Zealand, Papua New Guinea and the islands of the South Pacific).

17. South Pacific

    Includes routes via the South Pacific Ocean between on the one hand points in the Americas (that is IATA Tariff Conference 1) and on the other hand Australia, New Zealand, Papua New Guinea and the islands of the South Pacific.

ALLOCATION TO ROUTE GROUPS

All data referring to domestic legs of international operations should be included as international in data for the route group concerned. Any service with a single flight number should be allocated to the route group which covers travel from the point of origin to the point of destination. For example, a flight Zurich-Geneva-Abidjan-Dakar should be reported as a Europe/Middle East-Africa flight (in route group 10) and not split between domestic, Europe-Africa and Local Africa. Specify all reporting differences.

Also specify any services which fall into more than one route group, including the criterion used for allocating data amongst the route groups concerned.

QUESTIONNAIRE ON COSTS INCURRED BY INTERNATIONAL SCHEDULED AIR PASSENGER CARRIERS

(Reporting Guidelines and Geographical Descriptions Overleaf)

CARRIER NAME: _____

CALENDAR PERIOD: 12 MONTHS FROM _____ TO _____

REPORTING CURRENCY (US$ OR NATIONAL): _____

EXCHANGE RATE BETWEEN NATIONAL CURRENCY AND THE US DOLLAR DURING PERIOD: 1 US$ = _____

TOTAL AMOUNTS FOR CALENDAR PERIOD

SECTION I - EXPENSES AND OPERATING DATA BY AIRCRAFT TYPE

AIRCRAFT TYPE).....

See General Note b) above and check box(es) if cost data in this Section include: Domestic ☐ Non-Scheduled ☐

I.1	Flight operations expenses, excluding fuel and oil costs .....
I.2	Maintenance and overhaul expenses.....
I.3	Depreciation and amortization costs.....
I.4	Interest charges.....
I.5	Revenue block hours:
	a) operated on international scheduled services.....
	b) operated on international non-scheduled services..... .....
	c) operated on domestic services.....
	d) total all services.....

SECTION II - OPERATING EXPENSES BY GEOGRAPHICAL AREA

AREA .....
(OR ROUTE) (GROUP).....

See General Note b) above and check box(es) if data in this Section include: Domestic ☐ Non-Scheduled ☐

	NORTH AMERICA	CENTRAL AMERICA/ CARIBBEAN	SOUTH AMERICA	EUROPE	MIDDLE EAST	AFRICA	ASIA/ PACIFIC	
II.1	Aircraft fuel and oil.....							
II.2	Landing and associated airport charges.....							
II.3	Route facility charges							
II.4	Station expenses							

SECTION III - OTHER OPERATING EXPENSES

See General Note b) above and check box(es) if data in this Section include: Domestic ☐ Non-Scheduled ☐

	ALL AREAS
III.1 Passenger services (including cabin attendants).....	
III.2 Commission payments	
III.3 Other ticketing, sales and promotion	
III.4 General and administrative	
III.5 Miscellaneous operating expenses	

SECTION IV - BALANCE OF MISCELLANEOUS NON-OPERATING ITEMS .....

(Note: + = revenue, - = expense)

TOTAL - SECTIONS I TO IV .....

Remarks (Include description of any deviations from Reporting Guidelines and Geographical Descriptions overleaf.)

GENERAL

a) This questionnaire is to be returned completed by ICAO Contracting States for each of their airlines that provide international scheduled air passenger services. The material provided will not be made public in such a way as to permit identification of individual operators. Information provided should be the total amount for a 12-month period as close as possible to the calendar year specified in the covering State Letter, with the period being identified in the space provided. It is recognized that, in order for your reply to reach ICAO by the date indicated in the State Letter, final audited financial data may not be available, but preliminary data are acceptable. Similarly, if full information is not available for any Section of the questionnaire, partial and/or aggregated data would be appreciated.

b) All data provided should preferably refer only to international scheduled services. Should carriers not be able to break out such information separately, the domestic and/or non-scheduled data should be included; the appropriate box(es) at the beginning of each Section should then be checked. Data referring to domestic legs of international services should be included as international. Indicate any exceptions.

c) Financial data may be provided either in terms of national currency or in terms of U.S. dollars. In either case the weighted average annual exchange rate used or to be applied to convert national currency into U.S. dollars should be specified in the space provided.

d) All expense, revenue and operating data relating to freight and mail, including those for all-cargo aircraft operations, should be included where relevant in the questionnaire. Expenses incurred for the provision of services to other airlines such as maintenance, handling and catering should be excluded.

e) A brief description of each data item is given below. More detailed definitions of financial data items are given in the Instructions for completion of ICAO Air Transport Reporting Form EF-1, for airline Financial Data.

SECTION I - EXPENSES AND OPERATING DATA BY AIRCRAFT TYPE

Report for all aircraft types used, whether combination or all-cargo, using model designation (e.g. A300-B4, DC10-30CF, Boeing 747-200F).

I.1 Flight operation expenses, excluding fuel and oil costs. This item comprises flight crew salaries and expenses, flight equipment insurance, rental of flight equipment (excluding any payments made under aircraft capital or finance lease arrangements), flight crew training, and other flight expenses excluding those covered by Items I.2, I.3, I.4 and II.1.

I.2 Maintenance and overhaul expenses. Include here all expenses incurred for the repair, overhaul and maintenance of flight equipment, including payments to outside contractors and manufacturers. Exclude expenses incurred for the provision of maintenance and overhaul services to other airlines.

I.3 Depreciation and amortization costs. Incorporate all such costs relating to flight equipment, including depreciation charges for aircraft acquired through capital or finance lease arrangements. Depreciation of ground property and equipment should be included if possible under the appropriate headings or in Item III.5.

I.4 Interest charges. Include here gross interest charges on loans for the purchase of flight equipment, including the interest element of aircraft financing leases. Interest charges on other loans or overdrafts should be reported net under Item III.5.

I.5 Revenue block hours. Provide data by aircraft type wherever possible, even where disaggregated cost data for this Section are not available.

SECTION II - OPERATING EXPENSES BY GEOGRAPHICAL AREA

Geographical Areas are described below. Data for this Section may alternatively be reported by route group in accordance with the descriptions appearing in the associated questionnaire on revenues (in which case please specify each route group).

II.1 Aircraft fuel and oil. Include through-put charges, non-refundable duties and taxes.

II.2 Landing and associated airport charges. Include all charges and fees related to air traffic operations which are levied against the airline for services provided at the airport for landing charges, passenger and cargo fees, security, parking and hangar charges.

II.3 Route facility charges. Include all fees levied against the airline for the provision of route facilities and services. Where a single charge is levied for both airport and route facilities, the amount should be reported under Item II.2.

II.4 Station expenses. Include all expenses incurred (passenger and/or cargo) for traffic handling and aircraft loading and servicing, including payments to outside contractors. Exclude expenses incurred for sales staff at airports (to be included under Item III.3) and for the handling and servicing of traffic and aircraft of other airlines.

SECTION III - OTHER OPERATING EXPENSES

III.1 Passenger services. Include all expenses incurred for the provision of passenger services (including pay, allowances and expenses of cabin attendants and other passenger service personnel); premiums for passenger liability and accident insurance paid by the airline; expenses of handling passengers incurred because of cancelled and delayed flights. Exclude expenses incurred for the provision of passenger services to other airlines.

III.2 Commission payments. Include commissions payable to third parties for the sale of transportation on the airline's services, preferably on a gross basis (specify where different).

III.3 Other ticketing, sales and promotion. Include all expenses related to these three functions, including staff, accommodation, reservations, and advertising/publicity.

III.4 General and administrative. Include all expenses incurred in performing the general and administrative functions of the airline. Overhead costs directly related to specific functions should preferably be allocated elsewhere under the appropriate heading.

III.5 Miscellaneous operating expenses. Include all operating expenses which could not be assigned elsewhere in Sections I to III. Include here net interest charges on loans and overdrafts not related to the purchase of flight equipment (see Item I.4).

SECTION IV - BALANCE OF MISCELLANEOUS NON-OPERATING ITEMS

Include profits and losses from retirement of property and equipment, foreign exchange transactions, and miscellaneous non-operating items. Exclude payments from public funds and balance of income from affiliated companies.

DESCRIPTIONS OF GEOGRAPHICAL AREAS

North America

Canada and United States, including Hawaii and Alaska but excluding Puerto Rico and the Virgin Islands.

Central America/Caribbean

Bahamas, Belize, Bermuda, Costa Rica, El Salvador, Guatemala, Honduras, the islands of the Caribbean Sea (including Puerto Rico and the Virgin Islands), Mexico, Nicaragua and Panama.

South America

Argentina, Bolivia, Brazil, Chile, Colombia (including San Andres Islands), Ecuador, Falkland Islands (Malvinas), French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela.

Europe

Geographical Europe and Algeria, Azores, Canary Islands, Greenland, Iceland, Madeira, Malta, Morocco, Tunisia and Turkey.

Middle East

Bahrain, Cyprus, Democratic Yemen, Egypt, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Emirates and Yemen.

Africa

The continent of Africa and offshore islands, but excluding Algeria, Azores, Canary Islands, Egypt, Madeira, Malta, Morocco, Sudan and Tunisia.

Asia/Pacific

IATA Tariff Conference 3 (includes Asia to the east of the Islamic Republic of Iran and of the Ural Mountains, Australia, New Zealand, Papua New Guinea and the islands of the Pacific Ocean excluding the Hawaiian Islands, Midway and Palmyra).

II. Respondents to questionnaires

Contracting States or groups of States that provided replies to the air carrier revenue and cost questionnaires issued under cover of State Letter EC 2/20.3.2-92/33 of 5 June 1992:

Algeria[1], Australia, Austria, Bahrain, Bangladesh, Belgium, Bolivia, Brazil, Cameroon, Canada, Chile, Colombia, Costa Rica, Cuba, Cyprus[2], Denmark, Dominican Republic[2], Ecuador, Egypt, Fiji, Finland, France, Germany, Ghana[2], Greece, Gulf States[3], Guyana, Honduras, Hungary, Iceland, India, Indonesia, Ireland, Italy, Jamaica, Japan, Jordan, Madagascar, Malawi, Malaysia, Malta, Mauritius, Mexico, Morocco, Namibia, Kingdom of the Netherlands, Nigeria[2], Pakistan, Papua New Guinea, Paraguay[1], Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Rwanda, Saudi Arabia, Senegal, Scandinavia[4], Singapore, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic[2], Thailand, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, United Republic of Tanzania, United States, Yaoundé Treaty States[5] and Zambia.

— END —

1. Cost data only; no revenue data were provided for the airline(s) concerned.
2. Revenue data only; no cost data were provided for the airline(s) concerned.
3. Reply for Gulf Air which is the international scheduled airline of Bahrain, Qatar, Oman and the United Arab Emirates.
4. Reply for SAS which is the international scheduled airline of Denmark, Norway and Sweden.
5. Reply for Air Afrique which is the international scheduled airline of Benin, Burkina Faso, Central African Republic, Chad, Congo, Côte d'Ivoire, Mauritania, Niger, Senegal and Togo.

ICAO PUBLICATIONS IN THE AIR TRANSPORT FIELD

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

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

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

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

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

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

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

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