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Regional Differences in International Airline Operating Economics: 1998 and 1999

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Chapter 1

INTRODUCTION

1.1 This circular has been prepared pursuant to ICAO Assembly Resolution A33-19, Appendix G, which requests the Council to instruct the Secretary General to issue periodically “a study on regional differences on the level of international air transport operating costs, analysing how differences in operations and input prices may affect their levels and the impact that changes in costs may have on air transport tariffs”. This study on *Regional Differences in International Airline Operating Economics* succeeds one which covered the years 1992 to 1997 and was published in 2000 (Circular 280-AT/117). Prior to that, similar studies were published annually under the title *Regional Differences in Fares, Rates and Costs for International Air Transport*, which covered the years 1976 to 1992 (the 1992 results were published in Circular 254-AT/104). The studies will now be published biennially or every other year, although data will continue to be collected and analysed on an annual basis. The present circular focuses on the years 1998 and 1999.

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 revenue yield data for non-scheduled operations. With reference to the same route groups, regional differences in the costs related to the scheduled service passenger yields are presented in Chapter 3. The major causes of regional differences in costs are identified in Chapter 4. In Chapters 2 and 3, the 1999 results are compared with those for 1997. Caution, however, has to be exercised in the interpretation of the results since the description of the geographical areas has changed somewhat for the years 1998 and 1999 when compared to those for 1997, particularly with regard to the African, European and Middle East regions.

1.3 The description of route groups and geographical areas is provided in Appendix 1. The sources of data used in the study are given in Appendix 2, 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 3, together with information on the margins of uncertainty, a factor which should be borne in mind when considering the results of studies of this nature. Facsimiles of the questionnaire and information on responses appear in Appendix 4.

1.4 The primary sources of data for the study were two questionnaires which were dispatched to all Contracting States to be filled out with respect to their international air carriers. Until 1997, the questionnaires requested information for 17 international route groups. They were revised for 1998 and 1999 by expanding the number of route groups from 17 to 20 and by changing coverage of some geographical areas. Those revisions reflected changes endorsed by the General Prorate Meeting held in March 1999; the Prorate Agency uses the results of these studies to prorate passenger revenues from interline journeys. However, the changes were subsequently rescinded by a Special Prorate Meeting held in November 2000. In view of this and of the problems encountered in the reporting of data according to the revised requirements, it was decided to continue to carry out the studies based on 17 route groups. This thus required aggregation of some questionnaire data as described in Appendix 3.

1.5 Unless indicated otherwise, all references to “cents” in this circular mean “U.S. cents” and all references to “dollars” mean “U.S. dollars”.

Chapter 2

LEVELS OF UNIT REVENUES

Passenger traffic

2.1 Estimates of average unit passenger revenues in 1998 and 1999 by route group are presented in Table 2-1.

2.2 Column 1 of Table 2-1 shows the average revenue per passenger-kilometre for scheduled passenger traffic on each route group for 1998 and 1999. These data are considered representative of all airlines operating on the particular route group and also include estimates for non-reporting airlines. The data are presented without distinction to class of travel or fare type. Thus they represent the overall weighted average for all individual routes on all route groups and for all fare types. The overall average revenue per passenger-kilometre (excluding incidental revenues) was estimated at 7.81 cents for 1998 and 7.55 cents for 1999. However, the route group averages vary from a high of 16.9 cents in local Europe to a low of 4.9 cents on routes across the North and Mid-Pacific in 1998 and from a high of 15.8 cents in local Europe to a low of 5.0 cents on routes across the Mid-Atlantic in 1999. Due to inadequate representation in reporting, three route groups — Central America/Caribbean, local Africa and local Middle East — are not included in this analysis, although their estimates are included in the worldwide totals for both years.

2.3 Column 2 of Table 2-1 depicts the average revenue per passenger-kilometre for non-scheduled passenger traffic reported for each route group for 1998 and 1999. In this case, no attempt has been made to estimate the unit revenues for non-reporting air carriers. In addition, it should be borne in mind that the average unit revenues may not be for the same set of airlines for both years in each route group. The reason is that the availability of data is limited and dependent upon the reporting of air carriers whose composition may differ from year to year. The average revenue per passenger-kilometre for non-scheduled services ranges from a high of 9.9 cents for traffic across the North and Mid-Pacific to a low of 4.9 cents on routes between Europe/Middle East/Africa and Asia/Pacific in 1998 and from a high of 10.5 cents on routes between North America and Central America/Caribbean to a low of 4.1 cents on routes between Europe and the Middle East in 1999. Except for routes in local Europe, where the bulk of non-scheduled operations is to be found, the non-scheduled traffic reported is limited in volume. It is estimated that non-scheduled traffic represented some 14 and 12 per cent of the total international passenger-kilometres performed in 1998 and 1999, respectively. Columns 3 and 4 of Table 2-1 show the average passenger load factor for scheduled services and non-scheduled services, respectively.

2.4 On a worldwide basis, the estimated average revenue per passenger-kilometre for scheduled services at 7.55 cents in 1999 showed a decrease of almost 8 per cent from the level in 1997. Comparable data by route group between 1997 and 1999 are only available for 14 individual route groups. All these 14 route groups showed decreases, ranging from a reduction of some 13 per cent for routes in local South America to some 1 per cent for routes between Europe and the Middle East (Figure 2-1).

2.5 The changes in yields experienced between 1997 and 1999 reflect the strengthening of the U.S. dollar against most of the other world currencies, especially the currencies of countries in South America, Asia/Pacific, Europe and Africa. The relative change between 1997 and 1999 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 (paras. 3.10 and 3.11).

Table 2-1. Estimated average unit passenger revenues by international route group¹ for 1998 and 1999

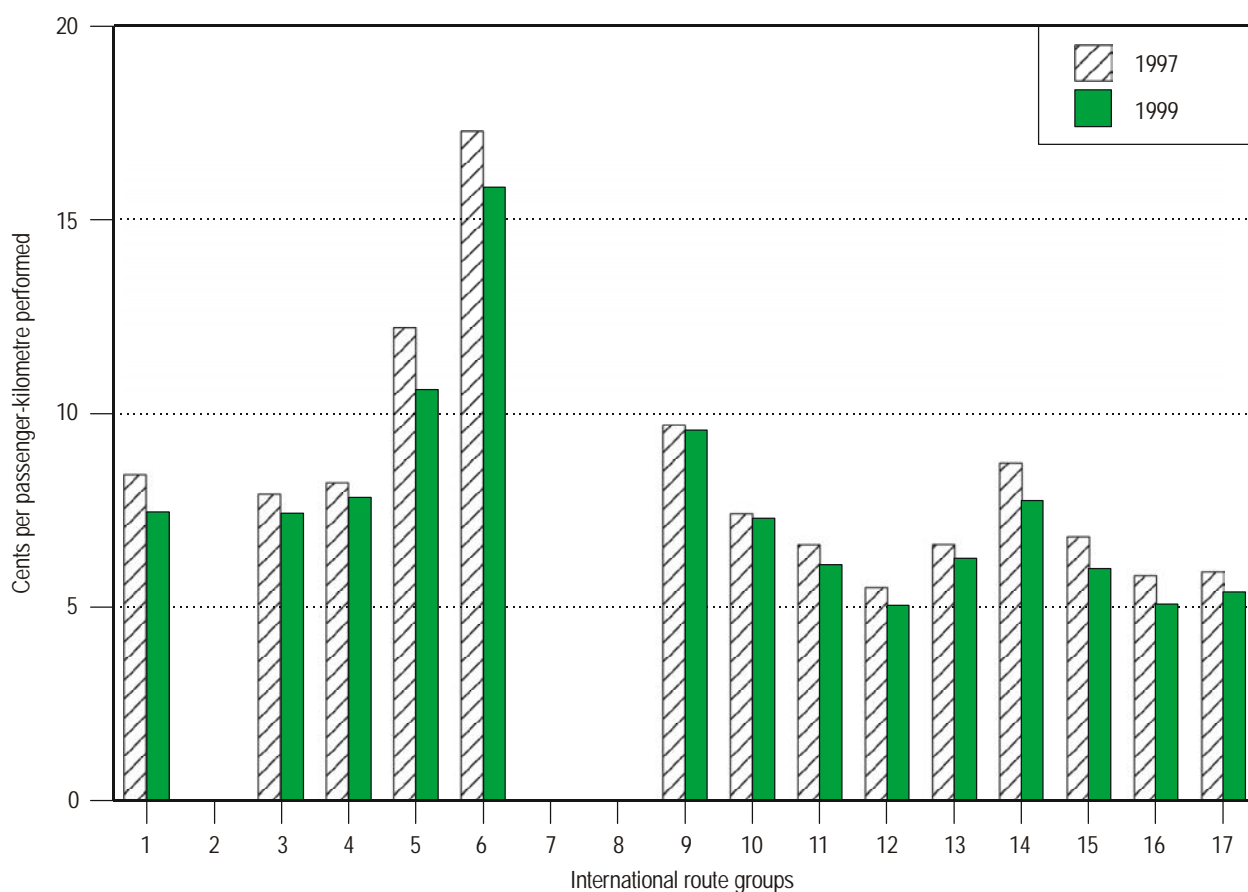
Route Group ²	Revenue (cents) per passenger-kilometre				Load Factors			
	Scheduled services ³		Non-scheduled flights		Scheduled services		Non-scheduled flights	
			All categories				All categories	
	(1)	(2)	(3)	(4)	1998	1999	1998	1999
1. Between North America and Central America/Caribbean	7.8	7.5	8.3	10.5	69	70	77	73
2. Between and within Central America and Caribbean	—	—	5.3	6.4	—	—	75	72
3. Between Canada, Mexico and the United States	7.6	7.4	8.1	6.3	64	66	77	79
4. Between North America/Central America/Caribbean and South America	8.1	7.8	5.4	5.8	59	61	78	67
5. Local South America	11.5	10.6	9.4	8.7	58	59	73	71
6. Local Europe	16.9	15.8	5.6	4.8	65	64	82	87
7. Local Middle East	—	—	—	—	—	—	—	—
8. Local Africa	—	—	—	—	—	—	—	—
9. Between Europe and Middle East	9.9	9.6	5.1	4.1	63	65	85	82
10. Between Europe/Middle East and Africa	7.6	7.3	6.2	6.3	69	67	80	83
11. North Atlantic	6.6	6.1	6.9	4.5	77	76	68	83
12. Mid-Atlantic	5.5	5.0	8.2	—	75	74	86	—
13. South Atlantic	6.7	6.3	—	—	71	68	—	—
14. Local Asia/Pacific	7.7	7.8	9.3	10.3	65	70	55	65
15. Between Europe/Middle East/Africa and Asia/Pacific	6.2	6.0	4.9	6.3	72	74	72	70
16. North/Mid-Pacific	4.9	5.1	9.9	6.9	71	72	52	60
17. South Pacific	5.6	5.4	—	—	69	72	—	—

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 services is described in Appendix 2 and the margins of uncertainty to be taken into account regarding the scheduled services are discussed in Appendix 3. For routes between and within Central America and Caribbean, in local Africa and local Middle East the representation was inadequate to justify separate presentation, but the data have been included in the world averages.

2. More detailed definition of the route groups may be found in Appendix 1.

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 as much as an additional 6 per cent over the average revenue quoted.

2.6 The analyses in paras. 2.2 to 2.5 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 in yields for each route group for 1998 and 1999 is shown in Tables 2-2 and 2-3, respectively. For a few route groups, the unit revenues for individual airlines do not vary much from the route group average (for example, for routes across the South Atlantic and South Pacific). However, on most route groups, the unit revenues differ significantly among airlines, reflecting differing route structures and traffic mix among other factors.



- | | | |
|--------------------------|-----------------------|-------------------------|
| 1. North-Central America | 7. Middle East | 13. South Atlantic |
| 2. Central America | 8. Africa | 14. Asia/Pacific |
| 3. North America | 9. Europe-Middle East | 15. Europe-Asia/Pacific |
| 4. North-South America | 10. Europe-Africa | 16. North/Mid-Pacific |
| 5. South America | 11. North Atlantic | 17. South Pacific |
| 6. Europe | 12. Mid-Atlantic | |

Figure 2-1. Comparison of unit passenger revenues: 1997 and 1999

Table 2-2. Variation in scheduled passenger revenue yield among airlines: 1998

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																										
			2 to 3	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 to 24	24 to 25	25 and over			
			Number of airlines																										
1. North-Central America	7.8	7		1	0	0	2	3	1																				
2. Central America	11.2	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1										
3. North America	7.6	12				2	6	3	1																				
4. North-South America	8.1	17		2	1	1	4	3	3	2	0	0	0	0	0	0	0	1											
5. South America	11.5	9									4	2	0	1	1	0	0	0	0	0	0	0	1						
6. Europe	16.9	26				2				1	3	1	1		2	3	0	3	1	1	3	1	1	1		2 ¹			
7. Middle East	14.5	3										1	2																
8. Africa	11.6	4					1	1	0	1	0	0	0	0	0	1													
9. Europe-Middle East	9.9	20			2	0	1	3	4	2	3	0	2	0	0	2	0	1											
10. Europe-Africa	7.6	21				3	6	3	5	0	1	1	0	0	0	0	1	0	1										
11. North Atlantic	6.6	31		2	6	11	9	3																					
12. Mid-Atlantic	5.5	9		1	2	2	2	1	0	1																			
13. South Atlantic	6.7	13			1	3	5	4																					
14. Asia/Pacific	7.7	14			1	1	3	3	0	1	3	0	0	1	0	0	1												
15. Europe-Asia/Pacific	6.2	30	1	5	6	3	6	6	0	3																			
16. North/Mid-Pacific	4.9	13		3	2	6	1	1																					
17. South Pacific	5.6	6	1	0	2	3																							

1. In the range of (25-26) and (27-28)

Table 2-3. Variation in scheduled passenger revenue yield among airlines: 1999

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																								
			2 to 3	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 to 24	24 to 25	25 and over	
			Number of airlines																								
1. North-Central America	7.5	9				2	2	2	1	2																	
2. Central America	11.1	5				1	0	1	0	1	1	0	0	0	0	0	0	0	1								
3. North America	7.4	11					1	6	3	0	1																
4. North-South America	7.8	18	1	1	1	2	4	5	1	2	1																
5. South America	10.6	11			2	0	0	1	1	0	2	1	0	1	0	1	1	0	0	0	0	0	1				
6. Europe	15.8	25			1	0	2	1	3	0	1	0	2	0	2	1	3	2	0	2	1	1	1				2 ¹
7. Middle East	15.0	3								1	0	0	0	0	0	1	0	0	1								
8. Africa	12.2	5								3	0	0	1	0	0	0	0	0	1								
9. Europe-Middle East	9.6	20				1	4	2	4	5	1	1	1	0	0	0	1										
10. Europe-Africa	7.3	23			3	2	5	7	1	0	1	0	1	0	0	0	1	1	1								
11. North Atlantic	6.1	35		3	12	10	7	2	0	0	1																
12. Mid-Atlantic	5.0	9		1	5	1	1	0	0	1																	
13. South Atlantic	6.3	11		1	2	4	4																				
14. Asia/Pacific	7.8	21				4	5	4	1	3	0	1	0	2	1												
15. Europe-Asia/Pacific	6.0	33		6	8	7	7	4	1																		
16. North/Mid-Pacific	5.1	16		4	4	3	4	1																			
17. South Pacific	5.4	4		1	0	3																					

1. In the range of (27-28) and (30-31)

Table 2-4. Reported average unit freight and mail revenues by international route group, scheduled services: 1998 and 1999¹

Route Group (Short Title)	Freight revenue (cents) per tonne-kilometre performed						Mail revenues (cents) per tonne-kilometre performed	
	Overall		Passenger and combination aircraft		All-freight aircraft		Scheduled services	
	(1)		(2)		(3)		(4)	
	1998	1999	1998	1999	1998	1999	1998	1999
1. North-Central America	22.6	26.8	22.6	26.8	—	14.0	29.1	32.0
2. Central America	34.8	36.6	34.8	36.6	—	—	20.0	33.3
3. North America	43.2	49.2	21.0	18.7	89.7	91.2	35.2	38.1
4. North-South America	32.0	37.1	25.5	19.6	42.4	111.8	31.1	33.5
5. South America	46.9	33.2	46.9	33.2	—	—	—	37.9
6. Europe	75.3	55.0	52.3	55.0	103.6	—	57.4	59.3
7. Middle East	21.8	54.2	21.8	58.7	—	24.4	45.3	57.9
8. Africa	18.4	30.6	18.4	30.6	—	—	—	36.7
9. Europe-Middle East	24.4	26.9	27.1	28.6	18.4	23.9	57.5	35.4
10. Europe-Africa	28.3	27.3	28.3	26.9	—	53.6	50.8	42.6
11. North Atlantic	23.7	23.0	17.6	15.9	43.9	50.0	25.4	23.7
12. Mid-Atlantic	23.3	28.2	23.3	28.2	—	—	40.1	40.1
13. South Atlantic	25.9	22.4	24.1	21.9	41.5	30.5	77.9	37.0
14. Asia/Pacific	29.1	30.3	31.4	32.3	23.9	25.4	37.6	39.3
15. Europe-Asia/Pacific	21.2	21.8	22.6	23.9	19.0	18.5	32.3	25.1
16. North/Mid-Pacific	23.8	23.1	20.0	19.4	25.6	24.9	34.7	35.0
17. South Pacific	16.6	19.1	16.6	19.1	—	—	27.8	24.7

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 2.

Freight and mail traffic

2.7 Average reported unit freight and mail revenues for the years 1998 and 1999 by international route group are presented in Table 2-4. It has to be borne in mind that the average unit revenues may not be for the same set of airlines for both years for each of the route groups. Again, the reason is that the availability of data is limited and dependent upon the reporting of air carriers whose composition may differ from year to year.

2.8 Column 1 of Table 2-4 shows the overall 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 75.3 cents on routes within Europe to a low of 16.6 cents on routes across the South Pacific in 1998 and from a high of 55.0 cents to a low of 19.1 cents on the same route groups in 1999. Comparing the figures of 1997 and 1999, 12 of the 17 route groups experienced a decrease, ranging from some 32 per cent for routes within South America to just under 3 per cent for routes between North and South America. Average freight yield across the North Atlantic, traditionally one of the lowest, decreased less than 4 per cent between 1997 and 1999. For the remaining 5 route groups, routes within Middle East showed an increase of almost 55 per cent while the freight yields within North America, across the Mid-Atlantic, between North and Central America and across the North/Mid-Pacific grew by some 33, 20, 12 and 1 per cent, respectively.

2.9 Columns 2 and 3 of Table 2-4 show the average revenue per tonne-kilometre performed for scheduled freight traffic carried on passenger or combination aircraft and on all-freight aircraft. The unit revenue from all-freight aircraft on some route groups is lower than that of passenger and combination aircraft because 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 across the North/Mid-Pacific), the difference in the revenue yields of passenger and combination aircraft and of all-freight aircraft may be less or even produce negative figures. This reflects the fact that, depending on the mix of traffic, the freight cost basis on combination aircraft may allow much lower rates to be offered than those on pure freight services. In the case of some routes involving North America, the higher freight revenue yield on all-cargo services reflects the data of major all-freight air carriers, which also include courier traffic and revenue in their figures.

2.10 Column 4 of Table 2-4 shows the average revenue per tonne-kilometre performed for airmail traffic on each route group (virtually all international mail is carried on scheduled services). The route group averages range from a high of 77.9 cents on routes across South Atlantic to a low of 20.0 cents on those within Central America in 1998 and from a high of 59.3 cents for routes within Europe to a low of 23.7 cents across the North Atlantic in 1999. Between 1997 and 1999, unit mail revenues decreased on 10 out of 16 route groups for which there are comparable data available. The decreases range from some 49 per cent for routes within Africa to some 2 per cent for routes between Europe/Middle East and Africa. The remaining 6 route groups saw their mail yields increase, ranging from some 27 per cent for routes within North America to less than 2 per cent for routes across the South Pacific. Unit mail revenues in general still remain significantly higher than unit freight revenues on scheduled services except for routes within Central America, North America and between North and South America.

2.11 The variation among individual airlines in freight revenue per tonne-kilometre for scheduled services for each route group for 1998 and 1999 is shown in Tables 2-5 and 2-6, respectively. For a few route groups, the unit revenues for individual airlines do not vary much from the route group average (for example, on routes across the Mid- and South Atlantic and the North/Mid-Pacific). However, as with passenger traffic, the unit revenues on most route groups differ significantly among airlines.

Table 2-5. Variation in scheduled freight revenue yield among airlines: 1998

Route Group (Short Title)	Average revenue (cents) per tonne-kilometre (all airlines from Table 2-4)	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 and over	
			Number of airlines																
1. North-Central America	22.6	6		2	1	2	1												
2. Central America	34.8	2				2													
3. North America	43.2	14	1	3	4	2	2	1	0	0	0	0	0	0	0	0	0	0	1 ¹
4. North-South America	32.0	17		4	6	4	1	1	0	0	0	0	1						
5. South America	46.9	7				2	0	2	2	0	1								
6. Europe	75.3	24				4	3	2	4	1	2	3	3	1	0	1			
7. Middle East	21.8	3		1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1 ²
8. Africa	18.4	4		1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1 ³
9. Europe-Middle East	24.4	18	1	1	7	2	3	2	1										1 ⁴
10. Europe-Africa	28.3	19		2	8	4	2	0	0	2	0	0	0	0	0	0	0	0	1
11. North Atlantic	23.7	33	2	16	8	4	1	1	0	0	0	0	0	0	0	0	0	0	1
12. Mid-Atlantic	23.3	9		2	7														
13. South Atlantic	25.9	12	2	7	2	1													
14. Asia/Pacific	29.1	15		1	7	2	2	1	0	1	0	0	1						
15. Europe-Asia/Pacific	21.2	30		12	12	4	0	1	0	0	0	0	1						
16. North/Mid-Pacific	23.8	16		8	4	3	1												
17. South Pacific	16.6	6		3	1	0	0	0	1	1									

1. In the range of (210-220)
2. In the range of (590-600)
3. In the range of (160-170)
4. In the range of (430-440)

Table 2-6. Variation in scheduled freight revenue yield among airlines: 1999

Route Group (Short Title)	Average revenue (cents) per tonne-kilometre (all airlines from Table 2-4)	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 and over	
			Number of airlines																
1. North-Central America	26.8	9		4	2	0	2	1											
2. Central America	36.6	5	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1 ¹
3. North America	49.2	13		4	4	1	3	0	0	0	0	0	0	0	0	0	0	0	1 ²
4. North-South America	37.1	19	1	7	5	1	0	2	1	0	0	0	0	0	0	0	2		
5. South America	33.2	7		1	2	3	0	0	0	1									
6. Europe	50.0	21		1	0	2	2	7	1	2	3	3							
7. Middle East	54.2	3					2	0	0	1									
8. Africa	30.6	4			1	1	0	1	0	0	0	1							
9. Europe-Middle East	26.9	20		2	6	6	3	2	1										
10. Europe-Africa	27.3	22	1	3	8	4	2	2	1	0	0	0	0	0	0	0	1		
11. North Atlantic	23.0	38	2	22	8	4	1	0	0	0	0	0	0	0	0	0	0	0	1 ³
12. Mid-Atlantic	28.2	9		5	3	0	0	1											
13. South Atlantic	22.4	10	1	3	6														
14. Asia/Pacific	30.3	22		2	9	3	2	2	2	1	1								
15. Europe-Asia/Pacific	21.8	35		10	18	5	2												
16. North/Mid-Pacific	23.1	18		11	4	2	1												
17. South Pacific	19.1	4		1	3														

1. In the range of (220-230)
2. In the range of (230-240)
3. In the range of (170-180)

Chapter 3

REGIONAL DIFFERENCES IN SCHEDULED PASSENGER UNIT REVENUES AND RELATED COSTS

Overall financial results by international route group

3.1 Selected operational data and estimated financial results for the years 1998 and 1999, overall and by route group, are presented in Table 3-1.

3.2 Column 1 of Table 3-1 shows that the number of scheduled airlines operating jet services in each route group ranged from a low of 15 on the South Pacific routes to a high of 171 serving routes in local Europe in 1998 and from a low of 16 to a high of 188 on the same route groups in 1999. It should be noted that the propeller aircraft operations of these airlines are excluded from the study, as are the operations of some 109 and 138 small international airlines which operated exclusively propeller-driven aircraft in 1998 and 1999, respectively. Together these operations with propeller aircraft represented about 0.7 and 0.8 per cent of world international seat-kilometres in 1998 and 1999, respectively, with their highest representations in any single route group being some 30 and 34 per cent between and within Central America and the Caribbean in 1998 and 1999, some 4 per cent in local Europe and about 3 per cent in local Africa for both years. Supersonic aircraft operations, which were also excluded, represented some 0.1 per cent of world operations.

3.3 The operational data included in columns 3 to 5 of Table 3-1 all have a significant effect on unit operating costs (see Chapter 4), and the world unit cost is also affected by the geographical traffic composition presented in column 2. 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. 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 however 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 1998 and 1999 indicates that for international routes as a whole, relevant incidental revenues not included in Table 3-1 were about 0.13 cents per passenger-kilometre in 1998 and 0.17 cents in 1999. If these relevant incidental revenues had been added to the estimated worldwide unit revenue, they would have increased the estimated worldwide unit revenue by about 2 per cent from 7.81 cents and 7.55 cents to 7.94 cents and 7.72 cents per passenger-kilometre in 1998 and 1999, respectively. For individual route groups, the passenger-related incidental operating revenues may represent as much as an additional 6 per cent over the average revenue.

Table 3-1. Basic operational data and financial results for scheduled passenger services by international route groups: 1998 and 1999¹

Route Group ²	Operational data										Financial results ³					
	Number of airlines		Percentage of world's international traffic (available seat-km)		Average length of flight stages (km)		Average number of seats per aircraft ⁴		Average passenger load factor (%)		Average revenue (cents) per pass-km ⁵		Average passenger costs (cents) per pass-km		Ratio revenue/Costs ^{5,6}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
I. All world international routes	386	438	100.0	100.0	2 037	2 063	231	231	69	70	7.81	7.55	8.02	7.89	0.97	0.96
II. International route groups																
1. North-Central America	34	34	1.9	1.9	1 553	1 593	171	169	69	70	7.8	7.5	8.9	8.8	0.90	0.85
2. Central America	21	26	0.2	0.2	713	755	128	131	—	—	—	—	—	—	—	—
3. North America	64	54	4.4	3.8	1 330	1 341	134	131	64	66	7.6	7.4	9.5	9.4	0.80	0.80
4. North-South America	38	41	4.2	3.9	2 807	2 849	202	202	59	61	8.1	7.8	8.3	8.2	0.95	0.95
5. South America	30	34	0.7	0.7	1 069	1 115	145	146	58	59	11.5	10.6	12.4	12.3	0.95	0.85
6. Europe	171	188	11.5	12.2	953	966	136	135	65	64	16.9	15.8	15.6	15.4	1.10	1.05
7. Middle East	18	19	0.4	0.4	783	828	180	174	—	—	—	—	—	—	—	—
8. Africa	53	54	0.7	0.7	1 131	1 161	159	156	—	—	—	—	—	—	—	—
9. Europe-Middle East	62	68	2.5	2.6	2 657	2 707	212	211	63	65	9.9	9.6	10.0	9.6	1.00	1.00
10. Europe-Africa	89	103	5.1	5.4	2 678	2 707	234	238	69	67	7.6	7.3	7.9	7.7	0.95	0.95
11. North Atlantic	68	72	19.2	20.0	5 624	5 707	268	267	77	76	6.6	6.1	6.5	6.5	1.00	0.95
12. Mid-Atlantic	29	31	3.3	3.5	5 584	5 784	302	297	75	74	5.5	5.0	6.0	5.9	0.90	0.85
13. South Atlantic	23	21	2.3	2.4	5 377	6 027	287	284	71	68	6.7	6.3	7.0	7.2	0.95	0.90
14. Asia/Pacific	105	104	12.7	11.8	1 978	2 059	263	265	65	70	7.7	7.8	7.8	7.4	1.00	1.05
15. Europe-Asia/Pacific	121	122	16.8	16.6	4 857	4 873	298	302	72	74	6.2	6.0	6.5	6.3	0.95	0.95
16. North/Mid-Pacific	30	30	12.4	12.2	6 662	6 725	342	340	71	72	4.9	5.1	6.0	6.0	0.80	0.85
17. South Pacific	15	16	1.7	1.7	6 093	6 438	349	341	69	72	5.6	5.4	5.9	5.7	0.95	0.95

1. Excluding operational and financial data attributed to supersonic and propeller-driven aircraft.

2. More detailed definition of route groups may be found in Appendix 1.

3. The margins of uncertainty which should be considered in relation to these results are discussed in Appendix 3.

For routes between and within Central America and Caribbean, in local Africa and local Middle East, the representation was inadequate to justify separate presentation, but the data have been included in the world averages.

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 0.13 and 0.17 cents per passenger-kilometre for 1998 and 1999, respectively. On individual route groups, it may represent as much as an additional 6 per cent over the average passenger revenue quoted.

6. Rounded to the nearest twentieth for individual route groups.

3.5 The average operating cost per passenger-kilometre for all international routes was 8.02 cents and 7.89 cents (column 7) in 1998 and 1999, respectively. The figures for individual route groups range from a high of 15.6 cents in local Europe to a low of 5.9 cents on routes across the South Pacific in 1998 and from a high of 15.4 cents to a low of 5.7 cents on the same route groups in 1999. These estimated costs include such items as depreciation and sales commission paid (which are sometimes accounted for differently) 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 0.97 for 1998 and 0.96 for 1999, with the ratios for individual route groups varying from 0.80 to 1.10 for 1998 and from 0.80 to 1.05 for 1999. Taking into account the relevant incidental revenues associated with international passenger traffic and the margins of uncertainty in estimated revenues and costs (discussed in Appendix 3), the revenue/cost ratio for all international passenger traffic is estimated to be between 0.96 and 1.02 in 1998 and between 0.94 and 1.02 in 1999, with a most likely value of 0.99 and 0.98 in 1998 and 1999, respectively.

3.7 The components of the total passenger costs are presented in Table 3-2. The primary breakdown is between "aircraft operating costs" (i.e. 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 1999 with those for 1997

3.8 An overall comparison between data for 1999 and corresponding data for 1997 shows a decrease of 5.7 per cent in the estimated passenger cost per available seat-kilometre, from 5.89 cents to 5.55 cents. Since the worldwide average load factor at 70 per cent showed virtually no change between 1997 and 1999, the cost per passenger-kilometre shows almost the same decrease of 5.9 per cent, from 8.39 cents to 7.89 cents (see column 7 of Table 3-1). Unit revenues (excluding incidental operating revenues) showed a decrease of 7.9 per cent, from 8.20 cents per passenger-kilometre to 7.55 cents in 1999 (see column 6 of Table 3-1). As a result, the overall revenue/cost ratio decreased from almost 0.98 in 1997 to 0.96 in 1999.

3.9 Between 1997 and 1999, 11 out of the 14 route groups for which comparable data were available showed decreases in costs per passenger-kilometre ranging from a reduction of some 14 per cent on routes within Asia/Pacific to some 0.5 per cent for those across the Mid-Atlantic. The remaining three route groups showed some increases (i.e. within North America, within South America and across the South Atlantic) ranging from some 3.6 per cent to almost 2 per cent (Figure 3-1).

3.10 As with the revenue figures discussed in Chapter 2, the comparison of unit costs between 1997 and 1999 has been affected in some cases 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 yields generally reflect market changes. Similarly, changes in unit costs in the Americas to a large extent reflect the general change in costs, as well as some operational changes, since the greater part of costs are generally borne in United States dollars.

3.11 Outside the Americas, for those route groups where, between 1997 and 1999, the mix of national currencies generally weakened against the United States dollar (such as route groups involving Africa, Asia/Pacific and Europe), with some exceptions which caused local distortions, the changes shown in revenues and costs when expressed in U.S. dollars are effectively overstated. Hence, between 1997 and 1999, the yields and costs expressed in local currencies for some of the route groups involving airlines from these regions would have shown increases rather than decreases

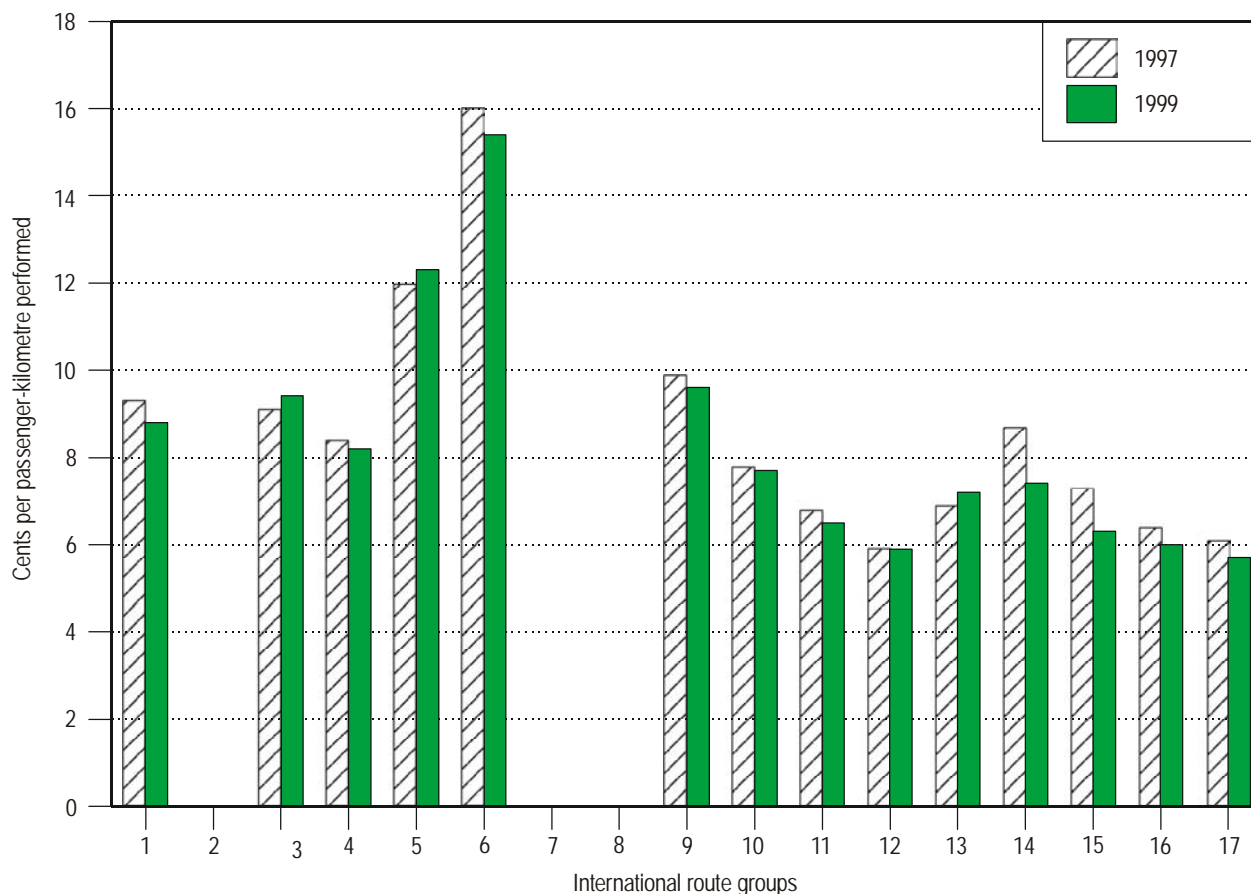
Table 3-2. Estimated passenger costs¹ per passenger-kilometre by cost item: 1998 and 1999

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		Aircraft fuel and oil		Landing and associated airport charges		En route facility charges		Station expenses		Passenger services		Commission		Ticketing, sales and promotion		General, administrative and miscellaneous		
			(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		
			1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998
I. All																					
Cents	8.02	7.89	2.38	2.34	0.82	0.88	0.36	0.35	0.28	0.27	0.85	0.83	1.31	1.26	0.75	0.72	0.59	0.57	0.68	0.67	
Percentage of total costs	100.0	100.0	29.7	29.7	10.2	11.2	4.5	4.4	3.5	3.4	10.6	10.5	16.3	16.0	9.4	9.1	7.4	7.2	8.5	8.5	
II. International route groups																					
1. North-Central America	8.9	8.8	3.0	2.9	0.9	0.9	0.2	0.2	0.1	0.1	1.4	1.4	1.3	1.3	0.8	0.7	0.6	0.5	0.6	0.9	
2. Central America	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3. North America	9.5	9.4	3.4	3.5	1.0	0.9	0.2	0.2	0.1	0.1	1.4	1.5	1.4	1.3	0.8	0.7	0.5	0.5	0.8	0.8	
4. North-South America	8.3	8.2	2.6	2.6	0.9	0.9	0.2	0.2	0.2	0.2	0.8	0.7	1.3	1.2	1.1	1.0	0.6	0.6	0.7	0.8	
5. South America	12.4	12.3	3.9	3.9	1.3	1.2	0.5	0.5	0.5	0.5	1.2	1.1	1.4	1.2	2.0	2.0	0.9	0.9	0.8	0.9	
6. Europe	15.6	15.4	4.6	4.6	1.0	1.1	1.3	1.2	0.8	0.8	2.2	2.1	2.1	2.1	1.6	1.5	1.4	1.3	0.7	0.7	
7. Middle East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
8. Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
9. Europe-Middle East	10.0	9.6	3.1	2.7	0.9	1.0	0.4	0.4	0.5	0.5	1.1	1.1	1.4	1.3	1.0	1.0	0.7	0.7	0.8	0.9	
10. Europe-Africa	7.9	7.7	2.5	2.3	0.9	1.0	0.3	0.3	0.4	0.4	0.7	0.7	1.2	1.2	0.6	0.6	0.5	0.5	0.9	0.7	
11. North Atlantic	6.5	6.5	1.8	1.9	0.7	0.7	0.2	0.2	0.2	0.2	0.7	0.7	1.2	1.1	0.6	0.6	0.4	0.4	0.7	0.7	
12. Mid-Atlantic	6.0	5.9	1.7	1.8	0.7	0.9	0.2	0.2	0.2	0.2	0.3	0.3	1.2	1.1	0.4	0.4	0.3	0.3	0.9	0.7	
13. South Atlantic	7.0	7.2	1.9	2.1	0.9	1.0	0.2	0.2	0.4	0.4	0.5	0.5	1.1	1.1	0.9	0.9	0.5	0.5	0.7	0.6	
14. Asia/Pacific	7.8	7.4	2.3	2.2	0.9	0.9	0.5	0.4	0.2	0.2	1.0	0.9	1.4	1.2	0.7	0.7	0.6	0.6	0.4	0.4	
15. Europe-Asia/Pacific	6.5	6.3	1.8	1.7	0.8	0.9	0.2	0.2	0.3	0.3	0.5	0.5	1.2	1.1	0.6	0.6	0.5	0.5	0.6	0.7	
16. North/Mid-Pacific	6.0	6.0	1.8	1.8	0.8	0.8	0.2	0.2	0.1	0.1	0.5	0.5	1.1	1.1	0.5	0.5	0.4	0.4	0.6	0.6	
17. South Pacific	5.9	5.7	1.7	1.6	0.8	0.8	0.2	0.2	0.1	0.1	0.5	0.4	1.1	1.0	0.8	0.7	0.4	0.4	0.5	0.6	

- "Passenger costs" have been derived for each route group by 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 indication only.
- This item includes flight operations expenses (cockpit crew salaries and expenses, rentals and insurance of flight equipment), aircraft maintenance and overhaul, and aircraft standing charges such as depreciation.

3.12 Of the 14 route groups analysed in this study for which comparable data were available, 11 showed a decrease in their respective revenue/cost ratios between 1997 and 1999, while the remaining three showed an increase (Figure 3-2). Contributions to these changes by different regional groups of airlines are discussed below.

3.13 For most of the 11 route groups where there was a deterioration in revenue/cost ratios, in general, yields expressed in cents per passenger-kilometre showed a significantly higher reduction than unit costs expressed in terms of cents per seat-kilometre. Some improvement in the passenger load factor on some of those route groups was insufficient to offset the decrease in yields. Two out of three route groups which showed some improvement in revenue/cost ratio also showed an increase in their respective average passenger load factors between 1997 and 1999.



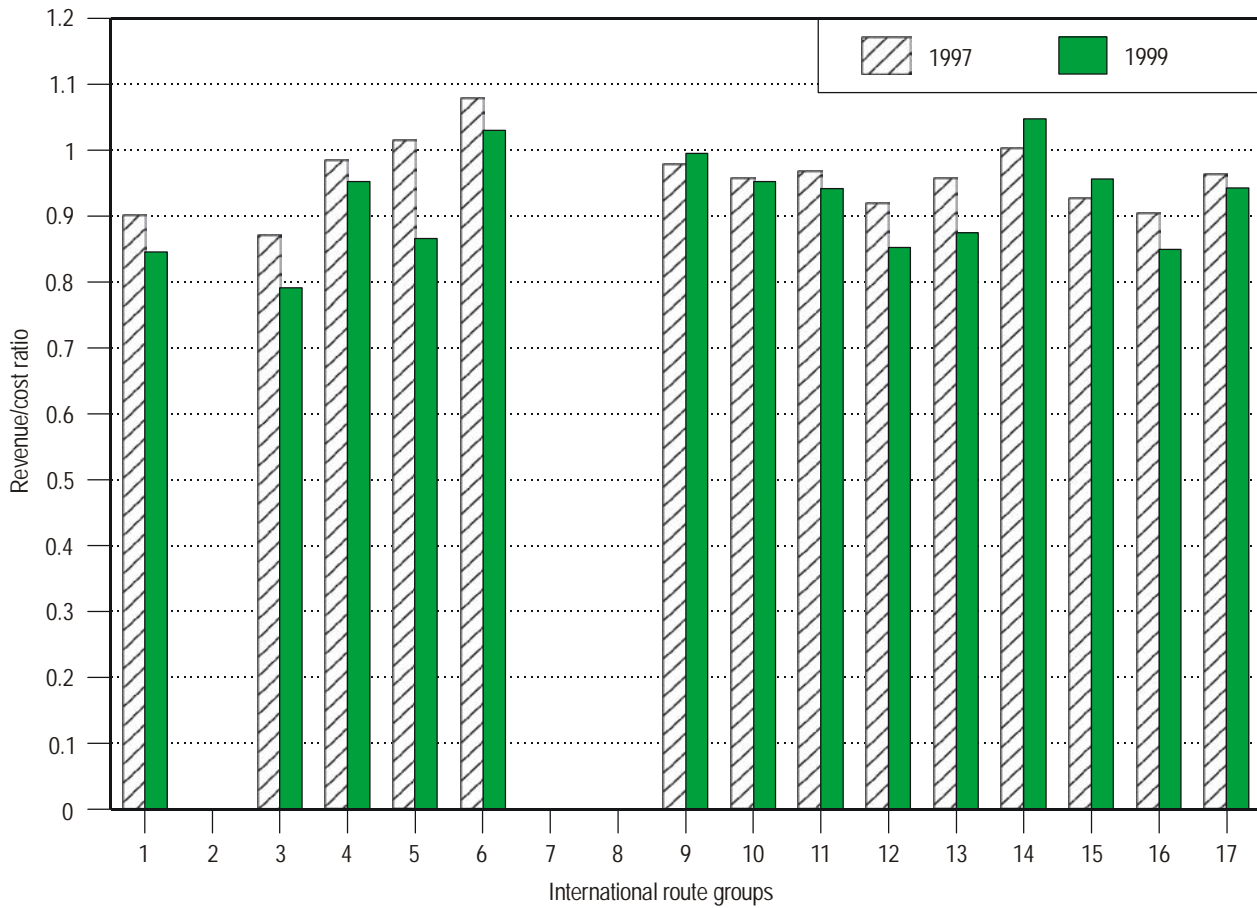
- | | | |
|--------------------------|-----------------------|-------------------------|
| 1. North-Central America | 7. Middle East | 13. South Atlantic |
| 2. Central America | 8. Africa | 14. Asia/Pacific |
| 3. North America | 9. Europe-Middle East | 15. Europe-Asia/Pacific |
| 4. North-South America | 10. Europe-Africa | 16. North/Mid-Pacific |
| 5. South America | 11. North Atlantic | 17. South Pacific |
| 6. Europe | 12. Mid-Atlantic | |

Figure 3-1. Comparison of total unit operating costs: 1997 and 1999

Variations in revenue/cost ratios among airlines

3.14 The overall financial results in Table 3-1 show that differences in revenues between route groups broadly reflect differences in costs. However, there are instances 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 early studies in this series, 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.

3.15 Analysis did, however, reveal several route groups within which the results obtained by different regional groups of airlines show significant differences.



- | | | |
|--------------------------|-----------------------|-------------------------|
| 1. North-Central America | 7. Middle East | 13. South Atlantic |
| 2. Central America | 8. Africa | 14. Asia/Pacific |
| 3. North America | 9. Europe-Middle East | 15. Europe-Asia/Pacific |
| 4. North-South America | 10. Europe-Africa | 16. North/Mid-Pacific |
| 5. South America | 11. North Atlantic | 17. South Pacific |
| 6. Europe | 12. Mid-Atlantic | |

Figure 3-2. Comparison of revenue/cost ratios: 1997 and 1999

3.16 Between 1997 and 1999, the airlines of the Asia/Pacific region, as a group, were able to improve their overall revenue/cost ratios, while those of Europe, North America and South America, each as a group, showed some decline in their respective operating ratios (airlines from Central America, Africa and the Middle East are excluded from this analysis because of their low representation).

3.17 Comparing the years 1997 and 1999, airlines registered in the Asia/Pacific region improved their revenue/cost ratio on routes within Asia/Pacific, between Europe/Africa/Middle East and Asia/Pacific and on North Atlantic routes. On routes across the South Pacific, the ratio remained almost unchanged while on routes across the North/Mid-Pacific, it declined somewhat. The Asia/Pacific airlines saw their average load factor on routes within Asia/Pacific improve by almost 5 percentage points. This improvement helped the revenue/cost ratio to increase even as yields fell below the unit cost per seat-kilometre. Similar trends were observed on routes between Europe/Africa/Middle East and Asia/Pacific and across the South Pacific, although the changes in the respective load factors, yields and unit costs per seat-kilometre were smaller, especially on the South Pacific route group. On routes across North Atlantic, the airlines of the region managed to increase the average load factor only marginally and that increase did not have any significant impact on the economic results. The revenue/cost ratio improved due to simultaneous increases in yields and marginal decreases in unit costs per seat-kilometre. On routes across the North/Mid-Pacific, the revenue/cost ratio deteriorated due to decreases in average load factors coupled with significant declines in both yields and unit costs per seat-kilometre.

3.18 Compared to 1997, airlines of the European region saw their revenue/cost ratios deteriorating on all route groups on which they operated except for routes between Europe/Africa/Middle East and Asia/Pacific where the ratio did not change. Generally, these airlines managed to decrease their unit cost per seat-kilometre on all route groups but their yields dropped even more. Load factors also deteriorated somewhat on the majority of route groups operated; thus unit costs per passenger-kilometre declined less than unit costs per seat-kilometre, resulting in the deterioration of revenue/cost ratios.

3.19 Airlines of the North America region also experienced some deterioration in their revenue/cost ratios on all route groups on which they operated, as compared to 1997. The biggest decline occurred on routes across the North/Mid-Pacific. Yields fell significantly on all route groups as did unit costs per seat-kilometre (with the exception of two route groups, i.e. local North America and across the South Pacific). Load factors increased on the majority of route groups, contributing to decreases in unit costs per passenger-kilometre. Those decreases were, however, lower than decreases in yields which resulted in deterioration of the revenue/cost ratios.

3.20 Compared to 1997, the airlines of the South American region in 1999 experienced the biggest decreases in their revenue/cost ratios among the regional groupings of airlines. While, except for local South America, yields decreased on all route groups on which these airlines operated, unit costs per available seat-kilometre declined moderately on only two route groups (i.e. across the Mid-Atlantic and the North/Mid-Pacific) and increased on the remaining four (between North and South America, local South America, across the South Atlantic and across the South Pacific). With the generally decreasing trend in load factors (except for three route groups — local South America, across North/Mid-Pacific and across South Pacific — where moderate increases were observed) resulting in even smaller decreases in unit costs per passenger-kilometre, the decrease in yields could not be offset and the airlines of the region saw their revenue/cost ratios deteriorating on all route groups, and particularly on local South America routes.

3.21 The variations in revenue/cost ratios among airlines in 1998 and 1999 are shown in Table 3-3. 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. In 1998 the revenue/cost ratios of individual carriers ranged from less than 0.7 to greater than 1.3 on 6 of the 14 route groups included in the analysis, while in 1999 the ratios in that range were observed on 3 out of 14 route groups included in this analysis.

Table 3-3. Variation of revenue/cost ratios amongst airlines: 1998 and 1999

Route Group (Short Title)	Average revenue/cost ratio (all airlines from Table 3-1)		Number of airlines in this analysis		Number of airlines									
	1998	1999	1998	1999	less than 0.7		0.7 to 0.9		0.9 to 1.1		1.1 to 1.3		greater than 1.3	
					1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
I. All world international routes	0.97	0.96	52	63	1	4	13	17	31	34	5	8	2	
II. International route groups														
1. North-Central America	0.90	0.85	5	7	1		3	4	1	2		1		
2. Central America	—	—	2	3	1		0	2	0	0	0	1	1	
3. North America	0.80	0.80	10	11			7	8	3	3				
4. North-South America	0.95	0.95	10	12	1	1	4	6	4	3	1	2		
5. South America	0.95	0.85	3	5			1	2	1	2	1	1		
6. Europe	1.10	1.05	20	17			2	3	9	11	8	3	1	
7. Middle East	—	—	3	2			2		1	1		1		
8. Africa	—	—	2	5	1	1	0	0	0	1	1	1		2
9. Europe-Middle East	1.00	1.00	17	14	3		4	4	8	9	1	1	1	
10. Europe-Africa	0.95	0.95	16	19	1	3	3	3	8	7	3	5	1	1
11. North Atlantic	1.00	0.95	25	29	1	4	9	11	13	13	1	1	1	
12. Mid-Atlantic	0.90	0.85	7	7		2	4	4	2	1	1			
13. South Atlantic	0.95	0.90	8	8		2	1	4	3	2	4			
14. Asia/Pacific	1.00	1.05	11	18		1	2	5	6	4	3	5		3
15. Europe-Asia/Pacific	0.95	0.95	25	26	3	5	9	8	10	8	2	5	1	
16. North/Mid-Pacific	0.80	0.85	12	15	1		7	7	3	7	1	1		
17. South Pacific	0.95	0.95	4	4	1	2	2	0	1	2				

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 14 international route groups for which adequate data were available for 1998 and 1999. This chapter is concerned with assessments of the 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 the aircraft equipment being used;
- b) the effect of differences among route groups in the average length of flight stages;
- c) the effect of varying fuel and oil prices 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 4.22 and 4.23 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 length of flight stages) determine the sizes of aircraft that are utilized in the route group, the number of seat-kilometres per departure and per flight hour that can be produced by these aircraft, and the possible utilization of the aircraft in terms of flight 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. The 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 1998 and 1999 for different categories of aircraft. Table 4-1 presents the average aircraft operating costs per block hour and

**Table 4-1. Operational and cost data for aircraft categories: 1998 and 1999
(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 stage operated (km)		Average utilization ³ (hours/day)		Aircraft operating costs ⁴			
										Dollars per block hour		Cents per available seat-km ⁵	
										(1)	(2)	(3)	(4)
		1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
World		100.0	100.0	231	231	2 037	2 063	9.3	9.4	3 820	3 873	2.3	2.3
Narrow-body short-haul	A320 B737 DC9 MD80	15.8	16.7	123	124	1 000	1 028	7.9	8.1	2 367	2 399	3.5	3.5
Narrow-body medium-haul	B727 B757 TU154	6.6	6.1	172	174	1 810	1 827	7.8	8.1	2 840	2 894	2.5	2.5
Narrow-body long-haul		0.2	0.1	151	159	3 178	3 400	4.1	4.4	2 611	3 114	2.4	2.7
Wide-body medium-haul	A300 A310 A330 B767	14.6	14.3	228	229	2 660	2 760	8.4	9.1	4 122	4 125	2.4	2.4
Wide-body long-haul	A340 B747 B763 B777 DC10 MD11	62.8	62.8	315	313	5 272	5 431	11.2	11.1	5 292	5 426	2.0	2.0

1. Only aircraft types providing more than 0.5 per cent of the world's international scheduled available seat-kilometres in 1998 and 1999 are listed in this column. The categorization of aircraft types is based on the average number of seats and length of flight stages in 1998 and 1999.
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 14.7 and 16.3 cents per litre for 1998 and 1999, respectively), aircraft maintenance and overhaul, and aircraft standing charges such as depreciation. If prevailing regional prices rather than the world average price were used for aircraft fuel and oil, there would be no change in the 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.

per available seat-kilometre for 5 categories of aircraft, grouped according to their size and by the length of haul for which they were generally used in 1998 and 1999. The average hourly cost varied from \$2 367 for narrow-body short-haul aircraft to \$5 292 for wide-body long-haul aircraft in 1998 and from \$2 399 to \$5 426 for the same categories in 1999. However, 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 2.0 cents, the lowest for any category. At the other end of the spectrum, the narrow-body short-haul aircraft averaged 3.5 cents per seat-kilometre for both years, which is some 75 per cent higher than the figure for wide-body long-haul aircraft.

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 transatlantic and transpacific routes, than on route groups with a short average stage length such as Europe, Central America and the Middle East.

Table 4-2. Aircraft operational data by route group: 1998 and 1999

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)	
	(1)		(2)		narrow-body		wide-body		(5)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
I. All world international routes	2 037	2 063	661	661	23	23	77	77	153	152
II. International route groups										
1. North-Central America	1 553	1 593	614	619	69	75	31	25	105	105
2. Central America	713	755	545	555	98	100	2		70	73
3. North America	1 330	1 341	583	579	91	92	9	8	78	76
4. North-South America	2 807	2 849	718	719	33	32	67	68	145	145
5. South America	1 069	1 115	588	590	71	68	29	32	85	86
6. Europe	953	966	520	521	86	89	14	11	71	70
7. Middle East	783	828	496	504	47	49	53	51	90	88
8. Africa	1 131	1 161	617	620	58	56	42	44	98	97
9. Europe-Middle East	2 657	2 707	669	674	29	30	71	70	142	142
10. Europe-Africa	2 678	2 707	700	700	18	18	82	82	164	167
11. North Atlantic	5 624	5 707	764	766	3	3	97	97	205	205
12. Mid-Atlantic	5 584	5 784	791	791	2	1	98	99	239	235
13. South Atlantic	5 377	6 027	793	797	0	0	100	100	228	226
14. Asia/Pacific	1 978	2 059	666	667	11	12	89	88	175	177
15. Europe-Asia/Pacific	4 857	4 873	748	751	4	4	96	96	223	227
16. North/Mid-Pacific	6 662	6 725	795	795	2	2	98	98	272	270
17. South Pacific	6 093	6 438	810	812	2	2	98	98	283	276

4.6 This relative economic advantage for the operations of long-haul routes is amplified by the fact that large wide-body aircraft 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 for routes within Central America, within North America and within Europe are in each case less than one-third of the seat-kilometres per block hour on the Mid-Atlantic, the North/Mid-Pacific and the South Pacific route groups.

4.7 Differences in aircraft fleet composition among route groups contribute to the differences in both aircraft and other operating costs, but mainly to 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 4.22 and 4.23.

4.8 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. The reason is that 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 4.22 and 4.23.

Prices for aircraft fuel and oil [factor c)]

4.9 The estimated total consumption of aircraft fuel and oil on international subsonic jet passenger routes in 1998 and 1999 was some 107 and 110 billion litres, respectively, and the total cost to the airlines was some \$15.8 billion for an average price per litre of 14.7 cents in 1998 and some \$17.9 billion for an average price per litre of 16.3 cents in 1999. Fuel represented some 10.2 and 11.1 per cent of the total passenger operating costs in 1998 and 1999, respectively, which was below the 1997 level of 12.2 per cent.

4.10 Detailed estimates have been made of the average price of fuel purchased in the different regions of the world (Table 4-3) and of the average price 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 1998 ranged from 13.0 cents in North America to 18.0 cents in Africa (some 38 per cent higher than the price paid in North America) and in 1999, from 14.1 cents to 19.7 cents for the same regions; fuel prices in 1999 were below the levels of 1997, worldwide by some 12 per cent, and on a regional basis ranging from some 9 per cent for Central America/Caribbean to 18 per cent for South America.

4.11 On a route group basis (Table 4-4), the estimated fuel prices range from a low of 13.2 cents per litre for routes across the North Atlantic to a high of 16.7 cents per litre for routes within South America in 1998 and from a low of 14.6 cents per litre for routes between North and South America to a high of 17.9 cents for routes within Asia/Pacific in 1999.

Airport and associated charges [factor d)]

4.12 As shown in Table 3-2, airport charges represented some 4.5 and 4.4 per cent of the total costs for international passenger operations in 1998 and 1999, respectively. The basis on which these charges are levied varies from airport to airport, but aircraft mass is the predominant element. A broad and

Table 4-3. Estimated unit fuel prices and airport charges by region: 1998 and 1999 (international scheduled services)

Area ¹	Aircraft fuel and oil prices (cents/litre)		Landing and associated airport charges (dollars/departed tonne) ²	
	1998	1999	1998	1999
World	14.7	16.3	11.2	11.2
North America	13.0	14.1	6.4	6.5
Central America/Caribbean	16.9	17.7	4.9	4.9
South America	16.2	16.3	6.5	7.2
Europe	14.1	16.1	16.9	16.2
Middle East	15.4	17.6	5.3	5.5
Africa	18.0	19.7	8.8	9.3
Asia/Pacific	15.8	17.6	10.1	10.5

1. More detailed descriptions of areas and route groups may be found in Appendix 1.
2. Tonnes of aircraft maximum take-off mass.

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 mass. Using this measure, estimated average airport charges in different regions of the world are presented in Table 4-3. The table shows that the world average was \$11.2 per tonne in both 1998 and 1999; the average charges in regions ranged from \$4.9 in Central America/Caribbean to \$16.9 in Europe in 1998 and from \$4.9 to \$16.2, respectively in 1999. En route charges are not generally included in these estimates because of the margin of uncertainty associated with their estimation on a regional basis.

4.13 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 \$4.0 per tonne for traffic within North America to \$17.5 for traffic within Europe in 1998 and from \$3.9 to \$17.0 for the same route groups in 1999. One of the reasons that airport charges in Europe appear high is because the airport passenger service charge is generally paid by the air carrier. This approach is also applied by a majority of States in the Caribbean and a significant proportion of States in Africa and the Middle East. But in most States in other regions of the world, the airport passenger service charges are collected from the passenger either at the point of embarkation or are added onto the ticket as a separate charge when the ticket is issued.

Load factor [factor e)]

4.14 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 1998 and 1999 varied significantly among route groups, from a low of 58 per cent on routes within South America to a high of 77 per cent on routes across the

Table 4-4. Estimated unit fuel prices and airport charges by route group: 1998 and 1999 (International scheduled services)

Route Group (Short Title)	Aircraft fuel and oil prices (cents/litre)		Landing and associated airport charges (dollars/departed tonne) ¹	
	1998	1999	1998	1999
I. All world international routes	14.7	16.3	11.2	11.2
II. International route groups				
1. North-Central America	15.0	14.9	4.6	4.3
2. Central America	—	—	—	—
3. North America	14.1	14.7	4.0	3.9
4. North-South America	15.0	14.6	6.2	6.6
5. South America	16.7	16.6	6.5	7.0
6. Europe	14.7	17.0	17.5	17.0
7. Middle East	—	—	—	—
8. Africa	—	—	—	—
9. Europe-Middle East	15.5	17.8	11.5	11.0
10. Europe-Africa	15.9	17.8	10.9	10.8
11. North Atlantic	13.2	14.8	11.1	10.7
12. Mid-Atlantic	15.4	17.4	10.9	10.4
13. South Atlantic	15.1	16.3	9.6	9.6
14. Asia/Pacific	16.1	17.9	10.3	10.2
15. Europe-Asia/Pacific	15.0	17.2	10.5	10.4
16. North/Mid-Pacific	13.9	15.5	9.6	10.7
17. South Pacific	14.4	15.1	9.2	9.7

1. Tonnes of aircraft maximum take-off mass.

North Atlantic in 1998 and from a low of 59 per cent to a high of 76 per cent on the same route groups in 1999, they had a significant influence on the 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 4.22 and 4.23.

Other causes of regional differences in costs

4.15 Among the factors that led to regional differences in the total cost of passenger operations in 1998 and 1999, 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*. Table 3-2 shows that together, they accounted for some 52 and 51 per cent of the total costs for international passenger operations in 1998 and 1999, respectively (compared with

50 per cent in 1997). 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.

4.16 **Station expenses** (column 5 of Table 3-2) relate mainly to the servicing of aircraft and passengers at airports. While they vary greatly among route groups, from 0.3 cents to 2.2 cents per passenger-kilometre in 1998 and from 0.3 cents to 2.1 cents per passenger-kilometre in 1999, some of the variations are due to the effects of differences in stage length.

4.17 **Passenger services** (column 6 of Table 3-2) relate primarily to cabin services provided in flight. In 1998 and 1999, passenger service costs represented some 16.3 and 16.0 per cent of total passenger operating costs, respectively. The differences in their level among the route groups, from 1.1 cents to 2.1 cents per passenger-kilometre in 1998 and from 1.0 cents to 2.1 cents in 1999, primarily reflect the differences in salary, service levels and utilization of cabin crew.

4.18 **Commission** (column 7 of 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 airline sales are handled by agents in different parts of the world and also reflect the intensity of competition and traditions in the product distribution methods on different regional markets. However, because the commission is usually a certain percentage of the price of the ticket, the variation in this cost item, from 0.4 cents to 2.0 cents per passenger-kilometre in both 1998 and 1999, is also related to the variation in average revenue per passenger-kilometre. In 1998 and 1999, commission expenses accounted for about 9.4 and 9.1 per cent of the world's scheduled international airline costs, respectively.

4.19 **Ticketing, sales and promotion** (column 8 of Table 3-2) is a cost item whose level is largely determined by decision-making within individual airlines. In 1998 and 1999, this item represented almost 7.4 and 7.2 per cent of passenger costs, respectively. The variation among the route groups, from 0.3 cents to 1.4 cents per passenger-kilometre in 1998 and from 0.3 cents to 1.3 cents in 1999, reflects differing competitive situations and the extent to which airlines handle their own sales in the various route groups.

4.20 Commission, ticketing, sales and promotion together reflect the overall cost of selling passenger tickets. Depending on the route group, between 14 and 25 per cent and between 14 and 27 per cent of total passenger revenues were used in 1998 and 1999, respectively, to defray this overall cost, with the world average at less than 17 per cent.

4.21 **General, administrative and miscellaneous expenses** (column 9 of Table 3-2) vary from 0.4 cents to 0.9 cents per passenger-kilometre in both 1998 and 1999. This partly reflects variations in the organizational structure and the accounting practices of airlines in different parts of the world, as well as variations in salary levels and the staff productivity among regions. Additionally, economies of scale may be an important factor affecting variations in this cost item since 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, those expenses, which include gains or losses due to changes in exchange rates, have been heavily influenced by fluctuations in exchange rates.

Summary of the causes of regional differences in costs

4.22 The effects of the factors described in 4.3 to 4.21 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 1998 and 1999, which was 8.0 cents and 7.9 cents, respectively. Columns 2 through 6 show the deviations from this world average that may be attributed to each of the individually assessed factors described in 4.3 to 4.14 above, and column 8 shows the aggregate effect of the other factors (some other factors were described in summary form in 4.15 to 4.21). Column 9 shows the resulting actual total costs per passenger-kilometre for each route group.

Table 4-5. Contributions to differences in costs among route groups: 1998 and 1999

Route Group (Short Title)	World average total passenger operating costs		Effect of aircraft mix on direct operating costs		Effect of stage length and average block speed		Effect of aircraft fuel and oil prices		Effect of landing and associated airport charges		Effect of load factor		Sum of effects in columns 2-6		Effect of other factors		Actual total passenger operating costs: columns 1+7+8	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
	(cents per passenger-kilometre)																	
I. All world international routes	8.0	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.0	7.9
II. International route groups																		
1. North-Central America	8.0	7.9	0.6	0.7	0.7	0.6	0.0	-0.1	-0.2	-0.2	0.0	0.1	1.1	1.1	-0.2	-0.2	8.9	8.8
2. Central America	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. North America	8.0	7.9	1.2	1.2	1.2	1.2	0.0	-0.1	-0.2	-0.2	0.6	0.4	2.8	2.5	-1.3	-1.0	9.5	9.4
4. North-South America	8.0	7.9	0.0	0.0	-0.6	-0.6	0.0	-0.1	-0.2	-0.1	1.0	0.8	0.2	0.0	0.1	0.3	8.3	8.2
5. South America	8.0	7.9	0.8	0.8	1.6	1.5	0.1	0.0	-0.2	-0.1	1.6	1.6	3.9	3.8	0.5	0.6	12.4	12.3
6. Europe	8.0	7.9	1.3	1.3	2.5	2.4	0.0	0.0	0.2	0.2	0.8	1.1	4.8	5.0	2.8	2.5	15.6	15.4
7. Middle East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8. Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9. Europe-Middle East	8.0	7.9	0.2	0.2	-0.3	-0.4	0.0	0.1	0.0	0.0	0.7	0.6	0.6	0.5	1.4	1.2	10.0	9.6
10. Europe-Africa	8.0	7.9	0.0	0.0	-0.5	-0.5	0.1	0.1	0.0	0.0	0.1	0.2	-0.3	-0.2	0.2	0.0	7.9	7.7
11. North Atlantic	8.0	7.9	-0.4	-0.4	-1.3	-1.3	-0.1	-0.1	0.0	0.0	-0.5	-0.4	-2.3	-2.2	0.8	0.8	6.5	6.5
12. Mid-Atlantic	8.0	7.9	-0.3	-0.4	-1.4	-1.4	0.0	0.1	0.0	0.0	-0.3	-0.2	-2.0	-1.9	0.0	-0.1	6.0	5.9
13. South Atlantic	8.0	7.9	-0.4	-0.4	-1.4	-1.4	0.0	0.0	0.0	0.0	-0.1	0.2	-1.9	-1.6	0.9	0.9	7.0	7.2
14. Asia/Pacific	8.0	7.9	-0.1	-0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.4	0.1	0.4	0.1	-0.6	-0.6	7.8	7.4
15. Europe-Asia/Pacific	8.0	7.9	-0.4	-0.4	-1.2	-1.1	0.0	0.0	0.0	0.0	-0.2	-0.2	-1.8	-1.7	0.3	0.1	6.5	6.3
16. North/Mid-Pacific	8.0	7.9	-0.5	-0.5	-1.5	-1.5	0.0	0.0	-0.1	0.0	-0.1	-0.1	-2.2	-2.1	0.2	0.2	6.0	6.0
17. South Pacific	8.0	7.9	-0.4	-0.4	-1.5	-1.5	0.0	-0.1	-0.1	0.0	0.0	-0.1	-2.0	-2.1	-0.1	-0.1	5.9	5.7

4.23 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. In 1998, for 9 of the 14 route groups included in the analysis, the effect of *stage length and average block speed* was the most important single factor; on the other 3 route groups, *load factor* was the most important single factor; on 1 route group, each of the factors contributed equally but none of them was consistently the dominant cause; and on 1 route group, the effects of *stage length and average block speed* and of *aircraft mix* also had equal impact. In 1999, for 8 of the 14 route groups included in this analysis, the effect of *stage length and average block speed* was the most important single factor; on the other 3 route groups, *load factor* was the most important single factor; on 1 route group, the *aircraft mix* was the most important factor; on 1 route group, each of the two factors, namely, *aircraft mix* as well as *stage length and average block speed* contributed equally; and on 1 route group, each of the three factors, namely, *aircraft mix*, *stage length and average block speed*, and *load factor* contributed equally. In addition, 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 cost was due to the other factors which do not lend themselves to precise analysis.

Appendix 1

DESCRIPTION OF ROUTE GROUPS AND GEOGRAPHICAL AREAS

I. 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/or Bermuda and/or St. Pierre et Miquelon and, on the other hand, Central America and the Caribbean. Routes between the United States and Puerto Rico/U.S. Virgin Islands are considered domestic and are excluded. Central America/Caribbean is defined as the geographical area covered by route group 2 (i.e. between and within Central America and the Caribbean) but *excluding* Mexico.

2. Between and within Central America and the Caribbean

Includes routes between or among: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Puerto Rico, Saint Kitts and Nevis¹, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands and Virgin Islands of the United States.

3. Between Bermuda, Canada, Mexico and the 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: 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, Azores, Canary Islands, Cyprus, Greenland, Iceland, Madeira, Malta, Russian Federation (west of Urals) and Turkey.

1. Formerly St. Christopher-Nevis

7. Local Middle East

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

8. Local Africa

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

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, Bermuda, Canada, St. Pierre et Miquelon and/or the United States (including Alaska and Hawaii but excluding Puerto Rico and Virgin Islands) and, on the other hand, the geographical areas defined by route groups 6, 7 and 8 (Europe/Middle East/Africa).

12. Mid-Atlantic

Includes routes between, on the one hand, gateway points in the geographical areas defined by route group 2 (Central America and the Caribbean) and/or in the following South American States: Bolivia, Colombia (including the San Andres Islands), Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela and, on the other hand, the geographical areas defined by route groups 6, 7, and 8 (Europe/Middle East/Africa).

13. South Atlantic

Includes routes between, on the one hand, gateway points in the following South American States: Argentina, Brazil, Chile, Falkland Islands (Malvinas), Paraguay and Uruguay and, on the other hand, the geographical areas defined by route groups 6, 7 and 8 (Europe/ Middle East/Africa).

14. Local Asia/Pacific

Includes routes between or among:

Asia: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Hong Kong S.A.R., India, Indonesia, Japan, Kazakhstan, Kyrgystan, Lao People's Democratic Republic, Macau, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Russian Federation (East of Urals), Singapore, Sri Lanka, Taiwan (Province of China), Tajikistan, Thailand, Turkmenistan, Uzbekistan and Viet Nam.

Southwest Pacific: Australia, New Zealand, Papua New Guinea and all other islands of the Pacific including American Samoa, Christmas Islands, Cocos (Keeling) Islands, Cook Islands, Fiji, French

Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, Niue, Norfolk Island, Northern Mariana Islands, Palau, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Wallis and Futuna Islands.

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

Includes routes between on the one hand the geographical areas defined by route groups 6, 7 and 8 (Europe/Middle East/Africa) and on the other hand that defined by route group 14 (Local Asia/Pacific).

16. **North/Mid-Pacific**

Includes routes via the North and Central Pacific Ocean between, on the one hand, points in the Americas as defined in route group 2 (Central America and the Caribbean), 3 (Bermuda, Canada and the United States) and 5 (Local South America) and, on the other hand, geographical area defined by route group 14 (Local Asia/Pacific) *except* Southwest Pacific.

17. **South Pacific**

Includes routes via the South Pacific Ocean between, on the one hand, points in the Americas as defined in route group 2 (Central America and the Caribbean), 3 (Bermuda, Canada and the United States) and 5 (Local South America) and, on the other hand, the area defined as Southwest Pacific in route group 14 (Local Asia/Pacific).

II. **Geographical Areas**

North America

Bermuda, Canada, St. Pierre et Miquelon, United States including Alaska and Hawaii, but excluding Puerto Rico and the Virgin Islands.

Central America/Caribbean

Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Puerto Rico, Saint Kitts and Nevis¹, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands and Virgin Islands of the United States.

South America

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

Middle East

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

1. Formerly St. Christopher-Nevis

Europe

Geographical Europe and Azores, Canary Islands, Cyprus, Greenland, Iceland, Madeira, Malta, Russian Federation (west of Urals) and Turkey.

Africa

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

Asia/Pacific

Afghanistan, Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Hong Kong S.A.R., India, Indonesia, Japan, Kazakhstan, Kyrgystan, Lao People's Democratic Republic, Macau, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea and all other islands of the Pacific (including American Samoa, Christmas Islands, Cocos (Keeling) Islands, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, Niue, Norfolk Island, Northern Mariana Islands, Palau, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Wallis and Futuna Islands), Philippines, Republic of Korea, Russian Federation (East of Urals), Singapore, Sri Lanka, Taiwan (Province of China), Tajikistan, Thailand, Turkmenistan, Uzbekistan and Viet Nam.

Appendix 2

DATA SOURCES AND COVERAGE

Sources

1. The primary sources of information for this study were two sets of questionnaires which were dispatched (under cover of State letters EC 2/20.3.2-99/104 of 5 November 1999 and EC 2/20.3.2-00/79 of 4 August 2000) to all Contracting States, to be filled out with respect to their international carriers. One questionnaire each year 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 66 and 65 States for 1998 and 1999, respectively. The second questionnaire sought information on costs for international scheduled passenger airlines, and replies were received with respect to 64 and 62 States for the years 1998 and 1999, respectively. Facsimiles of the two questionnaires and a list of States from which replies were received are given in Appendix 4.

2. As far as scheduled operations were concerned, another important source of information was a computer analysis carried out by the ICAO Secretariat of airline schedules obtained from the *Back Associates/Lundkvist*. The data obtained from this analysis were the number of departures, aircraft block hours and distance flown for each and every airline, and aircraft type operating in each of the route groups. In addition, research was carried out on the operating characteristics of aircraft types and sub-types, generating data on average number of seats (combination aircraft), fuel consumption per block hour (as a function of stage length), maximum take-off mass, payload, and volumetric capacity. This information was related to the basic data used 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, they include 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 *Digests of Statistics*.

Coverage

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 originated 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 3). 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 from 80 and 86 scheduled airlines (including 5 and 4 all-cargo airlines) and 1 and 3 other carriers for 1998 and 1999, respectively, and on cost data from 52 and 63 scheduled passenger airlines for 1998 and 1999, respectively.

6. The number of airlines and the coverage of international scheduled passenger traffic represented by revenue and cost data by region of airline registration are shown in Table A2-1 for the year 1998 and in Table A2-2 for the year 1999. The overall representation in terms of available seat-kilometres is 66 and 74 per cent for revenue data for 1998 and 1999, respectively, and 61 and 68 per cent for cost data for 1998 and 1999, respectively. In 1998, representation of the Middle East region at 33 per cent was the lowest and that of North America at 81 per cent was significantly higher than that for the other regions. In 1999, representation of the Middle East region at 42 per cent was again the lowest and that of North America at 90 per cent the highest among the regions.

7. For each route group, the number of airlines and the percentage of traffic represented by these airlines are shown in Table A2-3 for the year 1998 and in Table A2-4 for the year 1999. The differences in the overall representation between Tables A2-1 and A2-3 as well as between Tables A2-2 and A2-4 occur partly because of some differences in the ICAO Statistical Programme definitions on what constitutes a domestic or international service. Another reason is the different databases used for these tables; Tables A2-1 and A2-2 contain reported traffic, whereas Tables A2-3 and A2-4 include traffic volume according to published timetables.

8. As shown in Tables A2-3 and A2-4, in terms of available seat-kilometres, representation of either revenue or cost data is 60 per cent or above for 10 route groups in 1998 and for 11 route groups in 1999. Representation of some route groups on the cost side, however, is substantially lower than on the revenue side. For route groups in local Europe, between Europe and Middle East, in local Asia/Pacific and between Europe and Asia/Pacific in 1998 and in local Central America, local Europe, between Europe and Africa and across Mid-Atlantic in 1999, representation is below 60 per cent; hence cost and revenue figures must be interpreted with a certain degree of caution. For routes in Africa, Central America and the Middle East, the representation is so low (with few exceptions, below 30 per cent) as to cast significant doubt on the validity of the results for those route groups; hence figures for these route groups are not presented in this study, although their estimates are included in the worldwide totals.

9. The coverage of revenue data for non-scheduled passenger operations is shown in Tables A2-5 and A2-6 for 1998 and 1999, respectively, and the coverage of revenue data for scheduled freight and mail services is shown in Tables A2-7 and A2-8 for 1998 and 1999, respectively.

Table A2-1. Representation by ICAO region of airline registration: 1998

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	2 189 265	75	1 439 790	66	52	1 327 905	61
Africa	77 669	5	39 809	51	3	26 156	34
Asia/Pacific	623 158	12	338 167	54	10	331 893	53
Europe	817 399	23	541 302	66	18	514 421	63
Middle East	99 618	4	33 350	33	4	33 350	33
North America	438 232	12	394 366	90	9	355 881	81
Central America/ Caribbean	48 003	8	28 303	59	5	23 873	50
South America	85 186	11	64 493	76	3	42 331	50

Source: ICAO Air Transport Reporting Form A-1.

Table A2-2. Representation by ICAO region of airline registration: 1999

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	2 311 794	82	1 721 535	74	63	1 564 568	68
Africa	89 214	6	48 721	55	6	48 721	55
Asia/Pacific	651 875	20	543 806	83	18	525 402	81
Europe	885 571	25	579 565	65	17	468 305	53
Middle East	108 748	4	62 072	57	3	45 708	42
North America	447 006	10	402 850	90	10	402 850	90
Central America/ Caribbean	47 356	6	35 892	76	4	29 117	61
South America	82 024	11	48 629	59	5	44 465	54

Source: ICAO Air Transport Reporting Form A-1.

Table A2-3. Representation by international route group: 1998

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 groups	75	64	52	58
II. International route groups				
1. North-Central America	7	71	5	54
2. Central America	3	32	2	26
3. North America	12	73	10	65
4. North-South America	17	85	10	63
5. South America	9	79	3	52
6. Europe	26	57	20	51
7. Middle East	3	19	3	19
8. Africa	4	15	2	4
9. Europe-Middle East	20	53	17	52
10. Europe-Africa	21	61	16	53
11. North Atlantic	31	77	25	70
12. Mid-Atlantic	9	63	7	60
13. South Atlantic	13	80	9	70
14. Asia/Pacific	14	50	11	45
15. Europe-Asia/Pacific	30	53	25	52
16. North/Mid-Pacific	13	72	12	71
17. South Pacific	6	66	4	64

Table A2-4. Representation by international route group: 1999

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 groups	82	70	63	64
II. International route groups				
1. North-Central America	9	81	7	71
2. Central America	5	43	3	30
3. North America	11	76	11	76
4. North-South America	18	76	12	71
5. South America	11	72	5	62
6. Europe	25	51	17	43
7. Middle East	3	39	2	21
8. Africa	5	13	5	13
9. Europe-Middle East	20	63	14	46
10. Europe-Africa	23	59	19	52
11. North Atlantic	35	77	29	71
12. Mid-Atlantic	9	55	7	49
13. South Atlantic	11	71	8	66
14. Asia/Pacific	21	74	18	71
15. Europe-Asia/Pacific	33	72	26	62
16. North/Mid-Pacific	16	79	15	79
17. South Pacific	4	68	4	68

Table A2-5. Representative nature of revenue data for non-scheduled passenger operations by ICAO region of registration: 1998

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		Number of Carriers	Pass-km performed		Number of Carriers	Pass-km performed	
				No. (millions)	% of total		No. (millions)	% of total		No. (millions)	% of total	
All	257 585	116 826	140 759	39	17 385	7	38	10 285	9	1	7 100	5
Africa	6 781	4 701	2 080	0		0	0	0	0	0	0	0
Asia/Pacific	9 238	9 238	*	6	765	8	6	765	8	0	0	0
Europe	222 101	90 088	132 013	14	12 222	6	13	5 122	6	1	7 100	5
Middle East	3 470	3 470	*	1	513	15	1	513	15	0	0	0
North America	10 562	5 823	4 739	10	1 646	16	10	1 646	28	0	0	0
Central America/ Caribbean	3 659	1 732	1 927	3	979	27	3	979	57	0	0	0
South America	1 774	1 774	*	5	1 260	71	5	1 260	71	0	0	0

* Less than 0.5 million

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

Table A2-6. Representative nature of revenue data for non-scheduled passenger operations by ICAO region of registration: 1999

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		Number of Carriers	Pass-km performed		Number of Carriers	Pass-km performed	
				No. (millions)	% of total		No. (millions)	% of total		No. (millions)	% of total	
All	237 797	126 910	110 887	46	20 575	9	43	18 093	14	3	2 482	2
Africa	5 616	3 977	1 639	3	2 582	46	3	2 582	65	0	0	0
Asia/Pacific	3 354	3 354	*	12	2 377	71	12	2 377	71	0	0	0
Europe	210 251	106 255	103 996	14	11 561	5	11	9 079	9	3	2 482	2
Middle East	3 967	3 967	*	3	1 814	46	3	1 814	46	0	0	0
North America	10 757	7 023	3 734	8	463	4	8	463	7	0	0	0
Central America/ Caribbean	3 049	1 531	1 518	2	1 006	33	2	1 006	66	0	0	0
South America	803	803	*	4	772	96	4	772	96	0	0	0

* Less than 0.5 million

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

Table A2-7. Representative nature of revenue data for scheduled freight and mail services by ICAO region of airline registration: 1998

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	87 513	73	54 498	62	2 480	52	1 972	80
Africa	1 737	5	815	47	22	2	14	64
Asia/Pacific	31 259	13	16 229	52	699	11	477	68
Europe	29 408	21	18 638	63	843	15	683	81
Middle East	3 994	4	1 706	43	69	3	22	32
North America	17 133	15	14 331	84	793	12	738	93
Central America/ Caribbean	450	7	163	36	11	6	3	27
South America	3 532	8	2 616	74	43	3	35	81

Source: ICAO Air Transport Reporting Form A-1.

Table A2-8. Representative nature of revenue data for scheduled freight and mail services by ICAO region of airline registration: 1999

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	93 282	80	69 068	74	2 487	60	2 017	81
Africa	1 976	6	932	47	27	3	10	37
Asia/Pacific	34 622	21	28 924	84	752	17	672	89
Europe	30 527	21	19 240	63	812	19	526	65
Middle East	4 324	4	2 625	61	74	4	44	59
North America	18 319	13	15 892	87	771	11	732	95
Central America/ Caribbean	448	6	278	62	9	2	1	11
South America	3 062	8	1 177	38	42	4	32	76

Source: ICAO Air Transport Reporting Form A-1.

Appendix 3

METHOD OF ANALYSIS AND MARGINS OF UNCERTAINTY

Method of analysis

1. **General.** Data sources in general are discussed in Appendix 2. All airline financial data were initially adjusted where necessary to represent the calendar years 1998 and 1999 and converted where necessary from local currency to United States dollars. For currency conversions, the exchange rates provided by States in their reply to the questionnaires were used. In cases where an exchange rate was not supplied, the rate used was the average *IATA Clearing House Five-Day Monthly Rate* for 1998 and 1999.

2. Prior to detailed analysis, all financial and operational data were verified: (a) as to the mutual consistency and consistency with data from 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 2).

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 from the revenue questionnaires designed for this purpose (facsimiles of the revenue and the cost questionnaires are included in Appendix 4). However, for reasons described in the Introduction, some aggregation of the reported data had to be made. Questionnaire data for individual carriers for three route groups, namely, local Northern Europe, local Southern Europe and trans-Europe were aggregated into one route group, local Europe; and questionnaire data for individual carriers for two route groups, namely, between Europe and Japan/Korean Peninsula and between Europe/Africa/Middle East and Asia/Pacific (excluding Japan/Korean Peninsula) were aggregated into one route group, between Europe/Africa/Middle East and Asia/Pacific (for description of route groups and geographical areas, see Appendix 1). This information for individual carriers was aggregated for each route group in order 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, the questionnaire was designed so that 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 A3-1:

Category (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;

Category (B) — operating costs which are significantly related both to aircraft type and to geographical area of operation; and

Category (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.

6. Costs in the *first category (A)* were extracted from the data of 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 that was 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 according to route group or to geographical area. Where recorded by area, data were adapted to obtain corresponding data according to route group by using appropriate operational criteria (such as consumption in the case of “aircraft fuel and oil”). The relationships between route groups and geographical areas 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 by 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 from both traffic and regional differences in revenue yields (and hence regional differences in ticketing, sales and promotion costs).

9. For some airlines, cost data reported in the three categories were related 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 by using the same allocation procedures that were used to distribute costs among route groups.

10. As far as data for individual airlines were concerned, the total costs for the scheduled international passenger flights in each route group were estimated by adding all 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 in order to obtain the passenger costs. For this purpose, it was assumed that the cost of the 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.*** For all those carriers whose basic financial data were available, the procedures described in paras. 1 to 10 produced the total revenues and (for international scheduled passenger traffic) total costs on each route group according to the airline’s region of registration. In most cases, this financial database did not include all carrier operations. However, for scheduled passenger traffic, estimated revenues and costs presented in this study were formulated to cover all airlines operating on each route group.

Table A3-1. Procedures used to allocate individual airline costs among route groups

<i>Category of costs</i>	<i>Cost item (see note)</i>	<i>Airline data input to study</i>	<i>Cost allocation criteria</i>
A. Cost related primarily to aircraft type	I.1 Flight operation expenses, excluding fuel and oil costs	System-wide costs and system-wide block hours flown for each aircraft type operated	1-1.4 Number of block hours flown by each aircraft type on each route group
	I.2 Aircraft maintenance and overhaul expenses		
	I.3 Aircraft depreciation and amortization costs		
B. Costs related significantly to both aircraft type and geographical area of operation	II.1 Aircraft fuel and oil costs	Either: a) costs by geographical area of operation, or b) costs by route group (no allocation to route group necessary)	II.1 Fuel consumption by each aircraft type in each area of operation
	II.2 Landing and associated airport charges		II.2 Maximum take-off mass times number of departure for each aircraft type in each area of operation
	II.3 En route facility charges		II.3 Maximum take-off mass times number of block hours flown for each aircraft type in each area of operation
	II.4 Other station expenses		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	System-wide costs	III.1 Number of seat-hours on each route group
	III.2 Commission payments		III.2 Passenger and freight revenue earned on scheduled services from each route group
	III.3 Other ticketing, sales and promotion costs		III.3 Total revenue earned from each route group
	III.4 General and administrative expenses		III.4 Number of tonne-to kilometres performed in
	III.5 Miscellaneous operating costs		IV.1 each route group
	IV.1 Balance of miscellaneous non-operating items (excluding payments from public funds and balance of income from affiliated companies)		

Note.— Cost item references are those used in the cost questionnaire (see Appendix 4). The items themselves are described in the Reporting Guidelines on the reverse page of the cost questionnaire.

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 and the estimates also take into account the 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 A3-1), the average costs per block hour for the aircraft of airlines whose 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 the differences in the aircraft fleet, in block speed and in seating configuration. Costs in 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 had a very low representation, the grossing-up process for revenues and costs was adjusted to take into account the revenues and costs of major non-reported airlines based on data provided for previous studies as well as on 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, involves disaggregation of system-wide revenues and costs, or 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 as well as 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 to determine 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 1998 and 1999 are presented in paras. 16 to 22.

16. **Estimates of unit revenues.** The margin of uncertainty in the estimated unit revenues for a route group arises from limitations on the quality of reported data, from exchange rate fluctuations and, in the case of 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, leading to composite margins of uncertainty for the various route groups. The conclusion was that the estimated scheduled passenger revenue per passenger-kilometre can be relied for up to ± 6 per cent (with the exception of routes across the Mid-Atlantic) for 1998 and ± 6 per cent (with the exception of routes across the South Pacific) for 1999. Caution should be also exercised when interpreting the revenue data for routes between Europe and the Middle East, within Asia/Pacific and between Europe and Asia/Pacific for 1998 and for local Europe and across the Mid-Atlantic for 1999, due to the relatively low representation in these route groups. For regional routes in Africa, Central America and the Middle East, the representation was so low as to cast some doubt on the validity of the results for those route groups; hence revenue (and cost) figures for these routes are not presented in this study, although their estimates are included in the worldwide totals. A margin of uncertainty that is significantly narrower than ± 6 per cent applies for those route groups where the representation was relatively high. On a global basis, taking into account all route groups as a whole, the margin of uncertainty is reduced by compensatory effects and by scale and is thus estimated at ± 4 per cent for both years.

17. **Estimates of unit costs.** The estimated unit passenger costs for a route group contain similar elements of uncertainty as those for passenger revenues. In addition, further elements of uncertainty

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 with respect to the average unit costs for each route group and for all route groups combined. The margin of uncertainty in the estimated scheduled passenger costs per passenger-kilometre for all route groups presented (except that between Europe and Middle East for 1998 and that within South America for 1999) is considered to be within ± 9 per cent for both years. On the cost side, there were more route groups with lower representation, which increases the degree of uncertainty (see Appendix 2, para. 8). 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 ± 7 per cent for both years.

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

<i>Sources of uncertainty</i>	<i>Relative contribution to the margin of uncertainty</i>
Incomplete cost database	3
Generic nature of certain costs and use of standardized allocation procedures	3
Fluctuations in currency exchange rates	2
Others (primarily imperfections in reported data)	2
TOTAL	10

20. Much of the uncertainty arising from the generic nature of certain costs is inherent and cannot be influenced (see para. 17), and little can be done to reduce the uncertainty arising from fluctuations in currency exchange rates. A major factor in these studies therefore is 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 estimates of uncertainty cited in paras. 16 to 20 apply only to the overall average cost data (as presented in Chapter 3, Table 3-1). Estimates of individual elements making up the overall 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 interdependent. In other words, if the revenue on a route group is overestimated, the cost figure is also probably overestimated. This circumstance reduces the margin of uncertainty in the revenue/cost ratios when compared with the margins of uncertainty for either the revenue data alone or the cost data alone. The composite margin of uncertainty in the revenue/cost ratio for the individual route groups in this study is estimated at between ± 5 and ± 6 per cent for both years, and for all the route groups combined, it is estimated at ± 3.5 and ± 4 per cent for 1998 and 1999, respectively.

Appendix 4
QUESTIONNAIRES RELATING TO
REVENUES AND COSTS

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I. Facsimiles of questionnaires and attachments

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 (U.S.\$ or National)		TOTAL AMOUNTS FOR CALENDAR PERIOD								
Exchange Rate between National Currency and U.S.\$ during period: 1 U.S.\$ =										
Section I. Expenses and Operating Data by Aircraft Type		AIRCRAFT TYPE (please specify)								
See General Note b) overleaf and check boxes if cost data in this Section include:										
Domestic <input type="checkbox"/> Non-scheduled <input type="checkbox"/>										
I.1 Flight operations expenses, <i>excluding fuel and oil costs</i>										
I.2 Maintenance and over-haul expenses										
I.3 Depreciation and amortization costs										
I.4 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 or Route Group		AREA								
See General Note b) overleaf and check box(es) if data in this Section include:		OR								
Domestic <input type="checkbox"/> Non-scheduled <input type="checkbox"/>		ROUTE GROUP (please specify eg 13 NA)								
II.1 Aircraft fuel and oil		North America	Central America/ Caribbean	South America	Northern Europe	Southern Europe	Middle East	Africa	Japan/ Korean Peninsula	Asia/Pacific (excluding Japan/ Korean Peninsula)
II.2 Landing and associated airport charges										
II.3 Route facility charges										
II.4 Station expenses										
Section III. Other Operating Expenses		All Areas								
See General Note b) overleaf and check box(es) if data in this Section include:		Name and title of person completing questionnaire:								
Domestic <input type="checkbox"/> Non-scheduled <input type="checkbox"/>		Telephone No.:								
III.1 Passenger services (including cabin attendants)		Fax No.:								
III.2 Commission payments		Email:								
III.3 Other ticketing, sales and promotion		Remarks: (include description of any deviations from Reporting Guidelines and Geographical Descriptions overleaf)								
III.4 General and administrative										
III.5 Miscellaneous operating expenses										
Section IV. Balance of Non-operating Items (Note: + = revenue, - = expenses)		Note:								
TOTAL - SECTIONS I TO IV		Route group descriptions on back of page 2 of questionnaire on revenues. If route group option is used, route groups specified should be the same as those for which data are entered in the revenue questionnaire.								

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).

- 1.1 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 1.2, 1.3 and 1.1.
- 1.2 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.
- 1.3 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 1.1.5.
- 1.4 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.

SECTION IV - BALANCE OF NON-OPERATING ITEMS

Include profits and losses from retirement of property and equipment, foreign exchange transactions, gross interest charges on loans for the purchase of flight equipment, including the interest element of aircraft financing leases, net interest charges on loans and overdrafts not related to the purchase of flight equipment, and miscellaneous non-operating items. Exclude payments from public funds and balance of income from affiliated companies.

DESCRIPTIONS OF GEOGRAPHICAL AREAS

North America

Bermuda, Canada, St. Pierre et Miquelon, United States including Alaska and Hawaii, but excluding Puerto Rico and the Virgin Islands.

Central America/Caribbean

Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Puerto Rico, St. Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands and Virgin Islands of the United States.

South America

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

Middle East

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

Northern Europe

Austria, Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Greenland, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Netherlands, Norway, Poland, Romania, Russian Federation (West of Urals), Slovakia, Sweden, Switzerland, Ukraine and the United Kingdom.

Southern Europe

Albania, Andorra, Armenia, Azerbaijan, Azores, Bosnia Herzegovina, Canary Islands, Croatia, Cyprus, Gibraltar, Georgia, Greece, Italy, Madeira, Malta, Monaco, Portugal, San Marino, Slovenia, Spain, The former Yugoslav Republic of Macedonia (FYROM), Turkey (in Europe and Asia) and Yugoslavia.

Africa

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

Japan/Korean Peninsula

Democratic People's Republic of Korea, Japan and Republic of Korea

Asia/Pacific (excluding Japan/Korean Peninsula)

Afghanistan, Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Hong Kong S.A.R., India, Indonesia, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Macau, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea and all other islands of the Pacific (including American Samoa, Christmas Islands, Cocos (Keeling) Islands, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, Niue, Norfolk Island, Northern Mariana Islands, Palau, Pitcairn, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Wallis and Futuna Islands), Philippines, Russian Federation (East of Urals), Singapore, Sri Lanka, Taiwan (Province of China), Tajikistan, Thailand, Turkmenistan, Uzbekistan and Viet Nam.

QUESTIONNAIRE ON REVENUES OF INTERNATIONAL SCHEDULED AND NON-SCHEDULED AIR CARRIERS (Page 1 of 2 – Reporting Guidelines overleaf and Route Group Descriptions on back of page 2)

Carrier Name: CALENDAR PERIOD 12 Months from Reporting Currency (U.S.\$ or National): Exchange Rates between National Currency and U.S. Dollar during period: 1 U.S.\$ =	ALL Total Services (DOMESTIC plus INTERNATIONAL)	Total DOMESTIC Services	Total INTERNATIONAL Services (Total for route groups 1 to 20)	INTERNATIONAL SERVICES BY ROUTE GROUP							
				1	2	3	4	5	6	7	8
				Between North America and Central America/ Caribbean (NC)	Between and within Central America and the Caribbean (LC)	Between Bermuda, Canada, Mexico and the United States (LNM)	Between North America, Central America/ Caribbean and South America (NCS)	Local South America (LS)	Local Northern Europe (NE)	Local Southern Europe (SE)	Trans-Europe (TE)
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)											
Name and title of person completing questionnaire:				Telephone No.:			Fax No.:			Email:	
Remarks:											

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, along with 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% 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.

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 12) 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 REVENUES OF INTERNATIONAL SCHEDULED AND NON-SCHEDULED AIR CARRIERS (Page 2 of 2 - Reporting Guidelines on back of page 1 and Route Group Descriptions overleaf)

Carrier Name:	INTERNATIONAL SERVICES BY ROUTE GROUP											
	9	10	11	12	13	14	15	16	17	18	19	20
CALENDAR PERIOD 12 Months from												
Reporting Currency (U.S.\$ or National):												
Exchange Rates between National Currency and U.S. Dollar during period:												
1 U.S.\$ =												
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:												

DESCRIPTIONS OF ROUTE GROUPS

1. Between North America and Central America/Caribbean (NC)

Includes routes between on the one hand Canada and/or the United States (including Alaska and Hawaii) and/or Bermuda and/or St. Pierre et Miquelon and on the other hand Central America and the Caribbean. Routes between the United States and Puerto Rico/U.S. 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 (LC)

Includes routes between or among: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Puerto Rico, St. Christopher-Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands and Virgin Islands of the United States.

3. Between Bermuda, Canada, Mexico and the United States (LNM)

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 (NCS)

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 (LS)

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

6. Local Northern Europe (NE)

Includes routes between or among: Austria, Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Greenland, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Netherlands, Norway, Poland, Romania, Russian Federation (West of Urals), Slovakia, Sweden, Switzerland, Ukraine and the United Kingdom.

7. Local Southern Europe (SE)

Includes routes between or among: Albania, Andorra, Armenia, Azerbaijan, Azores, Bosnia Herzegovina, Canary Islands, Croatia, Cyprus, Gibraltar, Georgia, Greece, Italy, Madeira, Malta, Monaco, Portugal, San Marino, Slovenia, Spain, The former Yugoslav Republic of Macedonia (FYROM), Turkey (in Europe and Asia) and Yugoslavia.

8. Trans-Europe (TE)

Includes routes between the two geographical areas defined by route group 6 (Local Northern Europe) and route group 7 (Local Southern Europe).

9. Local Middle East (LM)

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

10. Local Africa (LA)

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

11. Between Europe and Middle East (EM)

Includes routes between on the one hand the geographical areas defined by route group 6 (Local Northern Europe) and/or route group 7 (Local Southern Europe) and on the other hand route group 9 (Local Middle East).

12. Between Europe/Middle East and Africa (EMA)

Includes routes between on the one hand the geographical areas defined by route group 6 (Local Northern Europe), and/or route group 7 (Local Southern Europe) and/or route group 9 (Local Middle East) and on the other hand the geographical area defined by route group 10 (Local Africa).

13. North Atlantic (NA)

Includes routes between on the one hand Bermuda, Canada, St. Pierre et Miquelon and/or the United States (including Alaska and Hawaii but excluding Puerto Rico and Virgin Islands) and on the other hand the geographical areas defined by route groups 6, 7, 9 and 10 (Europe/Middle East/Africa).

14. Mid Atlantic (MA)

Includes routes between on the one hand gateway points in the geographical areas defined by route group 2 (Central America and the Caribbean) and/or in the following South American States: Bolivia, Colombia (including the San Andres Islands), Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela and on the other hand the geographical areas defined by route groups 6, 7, 9 and 10 (Europe/Middle East/Africa).

15. South Atlantic (SA)

Includes routes between on the one hand gateway points in the following South American States: Argentina, Brazil, Chile, Falkland Islands (Malvinas), Paraguay and Uruguay and on the other hand the geographical areas defined by route groups 6, 7, 9 and 10 (Europe/ Middle East/Africa).

16. Local Asia/Pacific (LAP)

Includes routes between or among:
Asia: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Hong Kong S.A.R., India, Indonesia, Japan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Macau, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Russian Federation (East of Urals), Singapore, Sri Lanka, Taiwan (Province of China), Tajikistan, Thailand, Turkmenistan, Uzbekistan and Viet Nam
Southwest Pacific: Australia, New Zealand, Papua New Guinea and all other islands of the Pacific including American Samoa, Christmas Islands, Cocos (Keeling) Islands, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, Niue, Norfolk Island, Northern Mariana Islands, Palau, Pitcairn, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Wallis and Futuna Islands.

17. Between Europe and Japan/Korean Peninsula (EJK)

Includes routes between on the one hand the geographical areas defined by route group 6 (Local Northern Europe), and/or route group 7 (Local Southern Europe) and on the other hand Japan, Democratic People's Republic of Korea and Republic of Korea.

18. Between Europe/Middle East/Africa and Asia/Pacific (excluding Japan/Korean Peninsula) (EMAAP)

Includes routes between on the one hand the geographical areas defined by route groups 6, 7, 9 and 10 (Europe/Middle East/Africa) and on the other hand that defined by route group 16 (Local Asia/Pacific) except Democratic People's Republic of Korea, Japan and Republic of Korea.

19. North and Mid Pacific (PN)

Includes routes via the North and Central Pacific Ocean between on the one hand points in the Americas as defined in route group 2 (Central America and the Caribbean), 3 (Bermuda, Canada and the United States) and 5 (Local South America) and on the other hand geographical area defined by route group 16 (Local Asia/Pacific) except Southwest Pacific.

20. South Pacific (PS)

Includes routes via the South Pacific Ocean between on the one hand points in the Americas as defined in route group 2 (Central America and the Caribbean), 3 (Bermuda, Canada and the United States) and 5 (Local South America) and on the other hand the area defined as Southwest Pacific in route group 16 (Local Asia/Pacific).

II. Respondents to questionnaires

Covering the year 1998

Contracting States or groups of States that provided replies to the air carrier revenue and cost questionnaires issued under the cover of State Letter EC 2/20.3.2-99/104 of 5 November 1999.

Antigua, Argentina, Armenia, Australia, Azerbaijan, Belgium, Botswana, Brazil, Burkina Faso, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Denmark, Dominican Republic¹, Ecuador, Egypt, El Salvador, Fiji, Finland, France, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Kuwait, Kyrgyzstan, Lithuania, Madagascar, Malawi, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Norway¹, Oman, Pakistan, Philippines, Poland, Portugal, Republic of Moldova, Republic of Korea, Romania, Russia, Scandinavia², Seychelles³, Singapore, Slovakia, Slovenia, Spain, Sri Lanka, Switzerland, Tajikistan, Tanzania, Thailand³, Togo¹, Turkmenistan¹, United Kingdom, Uruguay, United States and Uzbekistan.

Covering the year 1999

Contracting States or groups of States that provided replies to the air carrier revenue and cost questionnaires issued under the cover of State Letter EC 2/20.3.2-00/79 of 4 August 2000.

Algeria, Antigua, Argentina, Australia, Austria, Bolivia, Botswana, Brazil, Canada, China, Colombia, Costa Rica, Cuba, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Fiji, Finland, France, Greece⁴, Hungary, Iceland, India, Iran, Israel, Jamaica, Japan, Lithuania, Madagascar, Malaysia, Mauritius, Mexico, Morocco, Norway, Oman, Pakistan, Panama⁵, Paraguay, Poland, Republic of Korea, Romania, Russia, Saudi Arabia, Scandinavia², Singapore, Slovak Republic, Slovenia¹, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Tajikistan, Thailand, Tunisia, Turkey, United Kingdom, United Republic of Tanzania, United States, Uruguay and Zimbabwe.

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1. Revenue data only, cost data not required for non-scheduled and/or cargo carriers.
 2. Reply for SAS which is the international scheduled airline of Denmark, Norway and Sweden.
 3. Cost data only, no revenue data was provided for the carrier concerned.
 4. Reply for Gulf Air, which is the international scheduled airline of Bahrain, Oman, Qatar and United Arab Emirates.
 5. Revenue data only, no cost data was supplied for the airline(s) concerned.

ICAO PUBLICATIONS IN THE AIR TRANSPORT FIELD

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

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

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

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

Circulars providing specialized information of interest to Contracting States. They include studies on trends in the air transport industry at a global and regional level and specialized studies of a worldwide nature;

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

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

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