Demand for Australian Domestic Aviation Services: Forecasts by Market Segment

Occasional Paper

This Paper examines the demand for air travel in Australia and forecasts domestic passenger and freight aviation demand to the end of the century at five-year intervals. The analysis begins by reviewing recent trends in patronage and air fares. It then identifies other major factors affecting demand as background for the empirical analysis. The study period for the empirical analysis covers the past eight years, 1977 to 1984, using quarterly data. The models provide, among other things, estimates of price and income elasticities of demand (or demand responses) for air travel in Australia. Finally, the Paper presents forecast growth rates for air travel subject to different future growth scenarios to the year 2000.

Subject
Series
Date
A to Z
Search
Results
Print
Exit
GO BACK

Occasional Paper 79

Demand for Australian Domestic Aviation Services

Forecasts by Market Segment

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FOREWORD

This Paper contains a demand analysis and forecasts to the year 2000 for domestic air passenger and freight services. Initially, much of the trunk airline analysis in this Paper was prepared for BTE Occasional Paper 72, *Competition and Regulation in Domestic Aviation: Submission to Independent Review*. Subsequently, a submission was prepared for The Review of New South Wales Air Services (BTE Information Paper 17, *Demand for NSW Intrastate Air Travel)* and work was undertaken on the remaining market sectors. This Paper draws together this work.

Research for the Paper was undertaken by Mr M. C. Streeting and Mr L. G. Walker of the Financial Assessment Branch under the supervision of Dr M. M. Saad of the Economic Assessment Branch.

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CONTENTS

TABLES

FIGURES

SUMMARY

The domestic aviation forecasts presented in this Paper are based on the assumption that there is no transfer of routes between operator classes or changes to the current regulatory arrangements. They are also based on various assumptions, both implicit and explicit, about changes in economic conditions including costs, real income levels, population and exchange rates. Significant alterations to the economic regulatory environment or the development of economic conditions outside the explicitly assumed ranges will effect the predictive power of the models used to generate the actual forecasts presented. However, the Paper contains other information, such as the relativities between market segments and estimates of passenger response to changes in income and fare levels, which is a useful addition to current knowledge about aviation activities.

The main findings of the study are:

RECENT TRENDS

Air fares

- Trunk economy air fares increased by 37 per cent in real terms between 1977 and 1984 (based on average fare increases resulting from changes to the jet economy air fare formula). Over the same period, economy air fares for the sample of East-West Airlines (EWA), Air New South Wales (ANSW) and Airlines of South Australia (ASA) routes all increased by approximately 30 per cent in real terms, while Airlines of Western Australia (AWA) fares increased by just under 10 per cent.
- For the period March quarter 1977 to December quarter 1983, real air fare increases for the sampled commuter routes ranged from 2 per cent in Western Australia to 38 per cent in Tasmania. For the sample of South Australian routes, the real fare increase was 1 per cent from the March quarter 1979 to the December quarter 1983.

Patronage

- For the period 1976-77 to 1983-84 total trunk airline patronage increased at an average annual rate of 1.5 per cent.
- Over the same period total regional airline patronage grew at an average annual rate of 3.5 per cent. EWA patronage grew markedly in 1982-83 and 1983-84 and achieved a 36 per cent share of total regional airline traffic in 1983-84. AWA and Airlines of Northern Australia (ANA) have also recorded strong growth; however, ANSW and ASA have not performed as strongly.
- Patronage on the sampled commuter routes varied considerably on a State by State basis. For the period 1979-80 to 1983-84 patronage on the sampled South Australian and Western Australian routes increased by 52 and 45 per cent respectively. Patronage on the New South Wales, Queensland and Tasmanian sampled routes declined by 11, 19 and 48 per cent respectively.

Freight

- Total domestic trunk airline freight (excluding IPEC Aviation) grew at an average annual rate of 3.1 per cent between 1976-77 and 1983-84.
- IPEC Aviation, which commenced cargo-only airline operations in March 1982, carried 15 per cent of total airline freight (that is, trunk and regional) in 1983-84.
- Between 1976-77 and 1983-84 total regional freight declined at an average annual rate of 2.2 per cent. Over the same period, total commuter air freight increased at an average annual rate of 4.7 per cent.

DEMAND ANALYSIS

Trunk air travel

- For the two highest density direct links (that is, Sydney-Melbourne/Brisbane) where business travel is expected to be important, the fare elasticities were -0.30 and -0.36 respectively.
- Air fare elasticity on non-holiday routes appears to increase in absolute terms with the length of the route.
- The importance of seasonal holiday travel to Queensland and Tasmania is reflected in the significance of the seasonal effect variables.

Regional air travel

The main results for New South Wales, South Australia and Western Australia are shown below. Data for Queensland were insufficient to draw any general conclusions and there are no regional airlines based in Victoria or Tasmania.

New South Wales

- Patronage on both short-haul (less than 400 kilometres) and long-haul (greater than 400 kilometres) routes are sensitive to real air fare changes.
- Demand on ANSW routes is relatively more sensitive to air fare changes in comparison to EWA routes, possibly indicating that passenger characteristics are different for the two operators.
- The business travel component would appear to be more important on those routes to larger regional centres than on routes to smaller country towns.
- Demand for travel to the North Coast area is very responsive to population growth in the region.

South Australia

- Demand is very responsive to changes in income in comparison to other States.
- Demand is responsive to changes in the price of alternative transport.

Western Australia

- Demand is relatively unresponsive to changes in air fares and the price of alternative transport probably reflecting the lack of suitable alternatives to regional air services in Western Australia due to the long distances involved.

Commuter air travel

Insufficient data were available to make any general observations for States other than New South Wales, South Australia and Western Australia. From the empirical analysis the following observations can be made:

New South Wales

- Demand for air travel on short-haul (less than 200 kilometres) routes is more than twice as responsive to changes in real air fares as demand on long-haul (greater than 200 kilometres) routes.

- Demand is very responsive to income changes on short-haul routes.
- There is evidence of substitution between modes over shorter routes.

South Australia

- The demand response to air fare changes is lower for services to Kangaroo Island than for mainland services.
- Demand for air travel to Kangaroo Island is very responsive to changes in both income and population.

Western Australia

- Demand is very responsive to air fare changes.
- Demand is responsive to changes in the price of alternative transport reflecting the greater potential for intermodal competition in comparison to regional services.

Domestic air freight

- The demand response with respect to the real freight rate is low for trunk, regional and commuter freight markets.
- Seasonality is an important factor in explaining the demand for trunk airline air freight.
- Both trunk and commuter air freight are responsive to changes in income.

FORECASTS

- Total trunk airline patronage under existing regulatory arrangements is expected to increase from just over 9.0 million passengers in 1984 to between 12.7 and 16.0 million passengers in the year 2000.
- Regional patronage in all States, with the exception of Queensland, is expected to grow under both high and low growth scenarios with total regional airline patronage increasing to between 2.7 and 3.2 million in the year 2000.
- Total commuter patronage is expected to grow from just over 950 000 in 1984 to between 1.4 and 1.9 million passengers in the year 2000.
- The volume of freight carried by both trunk (including IPEC Aviation) and commuter airlines is expected to grow moderately throughout the forecast period; however, freight carried by regional airlines is likely to remain close to present levels.

CHAPTER 1 INTRODUCTION

The Australian domestic air travel market has witnessed many important changes over the last decade. Apart from the impact of significant fluctuations in general economic conditions, there have been major policy changes and industry initiatives. For the period 1974-84 these have included:

- Establishment of a national air fare formula (1974)
- Domestic Air Transport Policy Review (1978)
- Introduction of off-peak/APEX fares and the promotion of group/holiday fares by Ansett Airlines of Australia (Ansett) and Trans Australia Airlines (TAA)
- Vertical integration by Ansett and TAA into tourist development
- Introduction of two-tier distance rate into air fare formula for long-haul routes (1980)
- Holcroft inquiry recommendations implemented - air fare formula flagfall component increased and distance component decreased (1981)
- Renegotiation of Airlines Agreement (1981)
- Introduction of different sized wide-bodied aircraft by major trunk airlines (1981)
- Introduction of larger jet aircraft by regional airlines (1981)
- Establishment of Independent Air Fares Committee (IAFC) (1981)
- IAFC Cost Allocation Review (1982)
- Major changes to jet economy air fare formula from linear function to include linear, quadratic and cubic distance components (1982)
- Deregulation of domestic air freight industry (1982)
- Changes to commuter safety regulations (1982)
- East-West Airlines enters Sydney-Canberra route (1982)

- Introduction of further discount fares for holiday travel by major airlines (1983)
- *Australian National Airlines Commission Retention Act (1984)* maintains full Commonwealth ownership of TAA
- Independent Inquiry into Aviation Cost Recovery (Bosch Inquiry) (1984).

SCOPE OF STUDY

This Paper examines the demand for air travel in Australia and forecasts domestic passenger and freight aviation demand to the end of the century at five-year intervals. The analysis begins by reviewing recent trends in patronage and air fares. It then identifies other major factors affecting demand as background for the empirical analysis. The study period for the empirical analysis covers the past eight years, 1977 to 1984, using quarterly data.[1] The models provide, among other things, estimates of price and income elasticities of demand (or demand responses) for air travel in Australia. Finally, the Paper presents forecast growth rates for air travel subject to different future growth scenarios to the year 2000.

DATA AND METHODOLOGY

In this Paper demand for air travel refers to uplifts and discharges within a flight, that is uplifts and final destination of revenue passengers[2] within a particular flight number.[3] Uplift-discharge data provide a good approximation of origin-destination data at the aggregate level. However, for some routes, uplift-discharge data do not provide a good approximation of origin-destination information. For example, the introduction of wide-bodied aircraft led to a substantial increase in the provision of direct flights. Although these alterations in service do not represent variations in origin-destination passenger patterns, uplift-discharge figures will reflect these changes. Where appropriate, a dummy variable was used in the empirical analysis for the period following the introduction of a direct service to account for this variation.

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1. Where possible, commuter models were estimated using quarterly data for the period March 1977 to December 1983.
2. Revenue passengers include passengers paying any fare.
3. As defined in Department of Aviation Air Transport Statistics (DofA 1985a), 'Uplifts and Discharges Within Flight' detail by direction the initial point of uplift and the final destination of revenue traffic within a particular flight number; that is, the movement between two airports not necessarily directly connected but within the same flight number series.

The demand data have been disaggregated according to trunk, regional and commuter services (or markets) in Australia. Overall 94 routes were sampled, consisting of 30 trunk routes (common to Ansett and TAA), 32 regional routes and 32 commuter routes. Aggregate demand models were estimated for each market using pooled cross-sectional and time-series data.

Forecasts for trunk, regional and commuter services on a market basis were estimated to the year 2000. In addition, individual forecasts are presented for 30 trunk routes. The forecasts assume that there is no transfer of routes between operator classes or changes to the current regulatory arrangements. Therefore, the forecasts must be interpreted as projections for the current classification and operation of trunk, regional and commuter services and may not apply in a different regulatory environment.

CHAPTER 2 TRENDS

This chapter reviews recent trends in patronage and air fares for trunk, regional and commuter air passenger markets. In addition, trends in total freight tonnage are summarised for the three markets.

TRUNK AIR TRAVEL MARKET

The trunk air travel market comprises those routes operated by the two major airlines Ansett Transport Industries (Ansett) and Trans Australia Airlines (TAA). The trunk routes consist of services between State and Territory capitals plus a number of other major centres[1] as defined in the *Airlines Agreement Act (1981)*. In recent years the trunk airlines have withdrawn services from some of the less dense routes which they previously serviced with F27 aircraft (such as Brisbane-Gladstone) and services on these routes are now generally provided by regional airlines.

Trunk airline patronage

Table 2.1 reports annual passenger movements (uplift-discharge) for Ansett and TAA for the 14-year period 1969-70 to 1983-84. Total regular passenger services grew from just over 5 million passenger movements in 1969-70 to almost 9 million in 1983-84 (an increase of 76 per cent). This represents an average annual growth rate of 4.1 per cent. Between 1980-81 and 1982-83 the number of passengers carried by the two airlines fell, reflecting largely the economic recession of the early 1980s, but recovered over the next two years. Over the period, the market share of passengers between Ansett and TAA has varied only slightly from 50 per cent, with TAA falling from nearly 51.7 per cent in 1969-70 to 49.1 per cent in 1981-82 but regaining its share to 50.1 per cent in 1983-84.

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1. Alice Springs, Cairns, Coolangatta, Gove, Launceston, Mackay, Mt Isa, Proserpine, Rockhampton and Townsville.

TABLE 2.1 TRUNK AIRLINE MARKET, TOTAL REVENUE PASSENGERS[a], ANSETT AND TAA MARKET SHARE, 1969-70 TO 1983-84

	Ansett		*TAA*		*Total*		*Market shares*	
Year	*Revenue passengers ('000)*	*Annual change (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*	*Ansett (per cent)*	*TAA (per cent)*
1969-70	2 421.2	..	2 590.5	..	5 011.7	..	48.3	51.7
1970-71	2 634.6	8.8	2 744.5	5.9	5 379.1	7.3	49.0	51.0
1971-72	2 766.9	5.0	2 909.5	6.0	5 676.4	5.5	48.7	51.3
1972-73	3 134.9	13.3	3 296.4	13.3	6 431.3	13.3	48.7	51.3
1973-74	3 801.4	21.3	3 856.5	17.0	7 657.9	19.1	49.6	50.4
1974-75	3 920.4	3.1	4 131.8	7.1	8 052.3	5.1	48.7	51.3
1975-76	3 949.3	0.7	4 055.7	-1.8	8 004.9	-0.6	49.3	50.7
1976-77	3 889.8	-1.5	4 093.0	0.9	7 982.8	-0.3	48.7	51.3
1977-78	4 330.4	11.3	4 455.8	8.9	8 786.2	10.1	49.3	50.7
1978-79	4 468.2	3.2	4 679.6	5.0	9 147.8	4.1	48.8	51.2

TABLE 2.1 (Cont.) TRUNK AIRLINE MARKET, TOTAL REVENUE PASSENGERS[a], ANSETT AND TAA MARKET SHARE, 1969-70 TO 1983-84

	Ansett		*TAA*		*Total*		*Market shares*	
Year	*Revenue passengers ('000)*	*Annual change (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*	*Ansett (per cent)*	*TAA (per cent)*
1979-80	4 884.9	9.3	5 057.0	8.1	9 941.9	8.7	49.1	50.9
1980-81	4 856.2	-0.6	5 012.6	-0.9	9 868.8	-0.7	49.2	50.8
1981-82	5 008.4	3.1	4 839.6	-3.5	9 848.0	-0.2	50.9	49.1
1982-83	4 430.8	-11.5	4 330.9	-10.5	8 761.7	-11.0	50.6	49.4
1983-84	4 408.3	-0.5	4 427.5	2.2	8 835.8	0.8	49.9	50.1
Average annual growth rate (per cent)								
1969-70 to 1983-84		4.4		3.9		4.1		
1976-77 to 1983-84		1.8		1.1		1.5		

a. Passengers paying any fare. Uplift-discharge patronage figures.

.. Not applicable.

Sources DoT (1982b). DofA (1985a).

TRUNK AIRLINE FARES

This section reviews recent trends in trunk airline fares and developments in fare formulae from 1974 to 1984.[2]

Air fares

Table IV.1 of Appendix IV presents indices of the current and real economy air fares, between 1974 and 1984, according to average air fare increases resulting from changes to the jet economy air fare formula. These data reveal that economy air fares have risen by 40.9 per cent, on average, in real terms since the introduction of the formula in 1974. Real air fares have risen by 37.3 per cent between 1977 and 1984 (the period under study) and the associated average annual growth rate was 4.6 per cent. However, real economy fares grew by 3.2 per cent between the December quarter 1983 and the December quarter 1984.

While economy air fares are used in this Paper as a major determinant of air passenger demand, it is important to note that the level of discounting also has a potentially significant effect on demand, particularly on major holiday destination routes. Unfortunately, insufficient data on passenger categories were available, either on a individual route or system basis, for this aspect to be explicitly considered in the analysis.

Air fare formulae

The above trends in air fares reflect the introduction and subsequent development of an air fare formula for the trunk airlines. Introduction of the first nationally based domestic air fare formula dates back to August 1974. A national average of three separate cost categories (terminal, line-haul and total overhead costs) was used as the basis for fare determination. This determination resulted in an average fare increase of about 12.5 per cent.

Since 1974 there have been over 20 fare determinations and two major changes to the air fare formula. Figure 2.1 details changes in the indices of the major components of the jet economy fare formula to 1984. Particular features of the period 1974 to 1982 are the far greater increase in the flagfall component in 1975 and from 1980 to 1982 and the accelerated overall average economy fares increase which occurred in 1975 and 1981. Following the IAFC Cost Allocation Review

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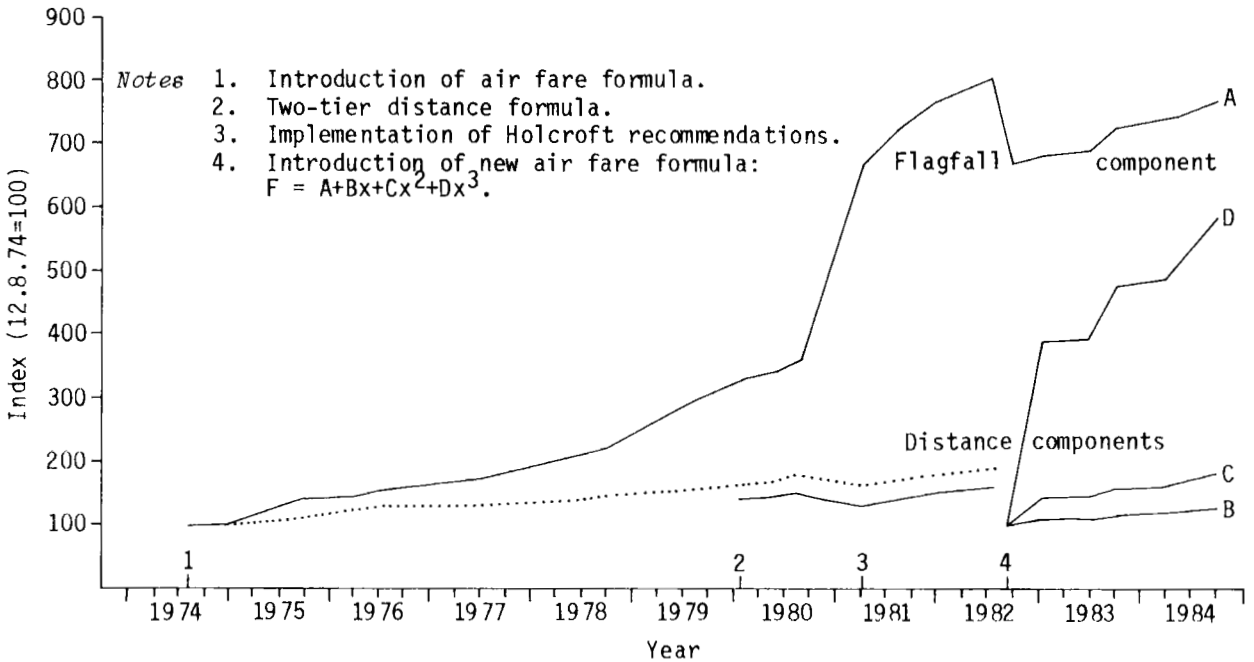
2. See Appendix IV for tables regarding air fares and air fare formulae for the trunk airlines.



Source Indices derived from BTE (1985d, 1974).

Figure 2.1 Indices of TAA and Ansett economy jet air fare formula components, August 1974 to December 1984.

in August 1982, the flagfall component was reduced by 17 per cent and the distance component was revised from a linear function to a combination of linear, quadratic and cubic components.

The effect of the various air fare formula changes on short-haul, medium-haul and long-haul routes for the trunk airlines is shown in Figure 2.2 for the period 1977 to 1984.[3] In this figure the most dramatic feature is the large increase in short-haul fares in April 1981 following implementation of the Holcroft Inquiry recommendations, while the effect of the August 1982 IAFC Cost Allocation Review on short-haul fares is less marked.

REGIONAL AIR TRAVEL MARKET

The regional air travel market is that segment of the domestic air transport industry served by the six airlines listed below:

- East-West Airlines (EWA);
- Air New South Wales (ANSW);
- Airlines of South Australia (ASA);
- Airlines of Western Australia/Ansett WA (AWA);
- Airlines of Northern Australia (ANA); and
- Air Queensland (AIRQ).

Regional airlines operate mainly over those routes between State capital cities and certain large regional towns. However, regional operators also operate over some trunk routes in direct competition with the trunk airlines or they provide an alternative to trunk airline travel over those routes via a number of ports.

ANSW, ASA, AWA and ANA are operating divisions of Ansett Transport Industries (ATI) and hence competition between these airlines and Ansett is virtually non-existent over the stages operated by Ansett. However, ATI's regional airlines compete with TAA on a number of routes (for example the Perth-Port Hedland, Port Hedland-Darwin and Perth-Darwin stages). EWA competes with both TAA and Ansett over some stages, such as Sydney-Coolangatta/Canberra/Hobart, Sydney-Newcastle/Newcastle-Brisbane, Sydney-Albury/Albury-Melbourne and Melbourne-Devonport/Wynyard.

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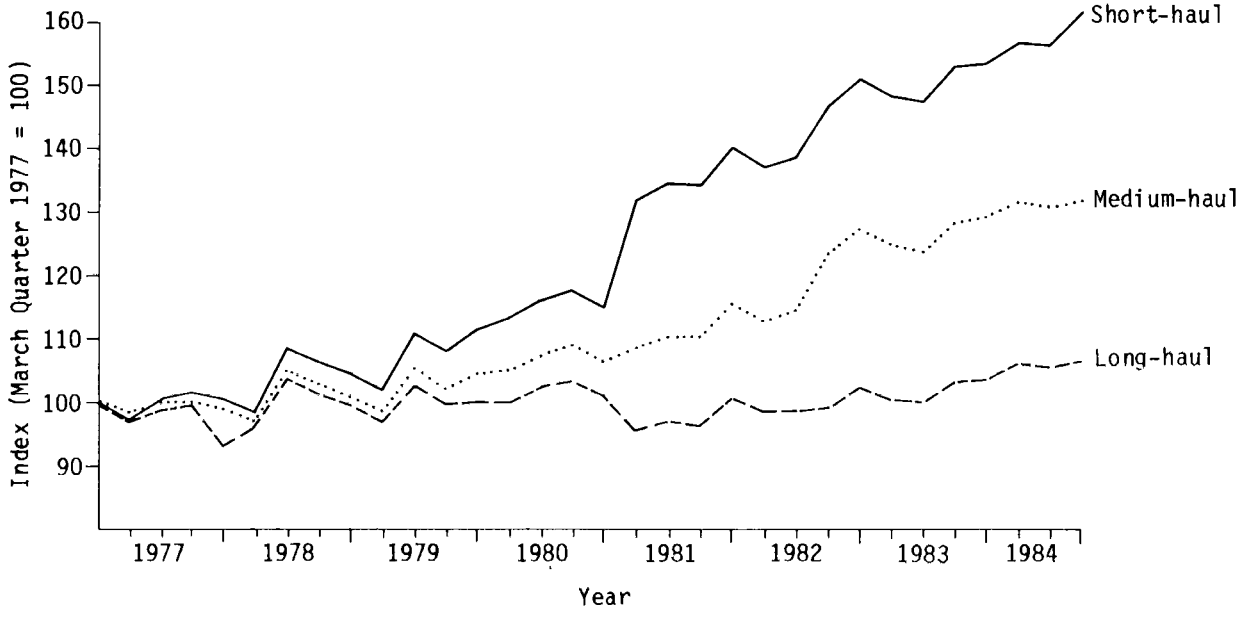
3. The weighted average fare indices for short-haul, medium-haul and long-haul routes were calculated from the sample of routes contained in Appendix I.



Source Derived from sample of routes.

Figure 2.2 Trunk economy real air fare indices, 1977–84

Competition between regional airlines occurs only infrequently such as is the case for EWA and ANSW on the interstate routes of Sydney-Devonport, Sydney-Canberra/Coolangatta and Sydney-Newcastle/Newcastle-Brisbane. Competition between the regional airlines and commuter operators is more widespread. In New South Wales EWA have withdrawn from several competitive commuter routes in recent years (for example Sydney-Bathurst/Orange/Parkes/Cowra in 1982) and commuter operators have taken over. ASA also experiences significant competition on its denser routes (Adelaide-Port Lincoln/Kingscote/ Whyalla) from a number of commuter operators. The apparent diversion of traffic from regional airlines to some commuter airlines may be due to a number of factors such as fare levels, service frequency and arrival and departure times.

Recent developments in the regional airline market include the commencement of Skywest Airlines commuter operations on some AWA routes in 1984 (Perth-Geraldton/Kalgoorlie) and the takeover of EWA by Skywest Airlines in 1983. EWA subsequently started a Perth-Yulara/ Yulara-Sydney service in competition with the major trunk airlines' east-to-west coast services. In Queensland, AIRQ has undertaken a gradual changeover of its commuter routes to airline status since 1982, and as at June 1984 it has three F27s in operation on its regional routes. In addition, AIRQ was taken over by TAA in March 1985.

Regional airline patronage

Table 2.2 presents trends in regional airline patronage for the 14-year period 1969-70 to 1983-84. The table shows that total regional passenger travel in Australia has fluctuated around a general upward trend over the period. Patronage grew steadily to 1.57 million revenue passengers in 1978-79 then declined in 1979-80 and 1980-81. Since 1980-81 total patronage has recovered with strong growth in 1983-84 to reach 1.76 million revenue passengers. The average annual growth rate since 1969-70 has been 4.4 per cent and since 1976-77, 3.5 per cent.

Trends in patronage of individual regional airlines have varied considerably over the period. EWA has grown markedly over the past few years to 630 000 passengers in 1983-84 (36 per cent of total regional passengers), partly reflecting the introduction of new services by the airline. AWA and ANA have also recorded strong growth while ANSW and ASA have not performed as strongly.

TABLE 2.2 REGIONAL AIRLINE MARKET, TOTAL REVENUE PASSENGERS[a], 1969-70 TO 1983-84

	EWA		ANSW		ASA		AWA[b]		ANA[c]		AIRO[d]		Total[e]	
Year	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)	Revenue passengers ('000)	Annual change (per cent)
1969-70	283.7	..	283.3	..	166.9	..	191.0	..	21.7	..	..	..	969.9	..
1970-71	301.7	6.3	276.3	-2.5	163.8	-1.9	264.7	38.6	19.7	-9.2	..	..	1 050.2	8.3
1971-72	327.3	8.5	271.5	-1.7	158.8	-3.1	288.0	8.8	23.1	17.3	..	..	1 093.4	4.1
1972-73	385.4	17.8	306.8	13.0	164.6	3.7	261.4	-9.2	26.7	15.6	..	..	1 172.6	7.2
1973-74	435.3	13.0	335.6	9.4	192.2	16.8	312.9	19.7	39.5	47.9	..	..	1 345.8	14.8
1974-75	479.2	10.1	382.4	14.0	202.7	5.5	322.5	3.1	47.2	19.5	..	..	1 456.5	8.2
1975-76	444.6	-7.2	370.9	-3.0	215.1	6.1	304.1	-5.7	54.0	14.4	..	..	1 410.8	-3.1
1976-77	435.7	-2.0	376.3	1.5	212.3	-1.3	292.6	-3.8	53.4	-1.1	..	..	1 383.3	-1.9
1977-78	493.0	13.2	395.1	5.0	227.0	6.9	326.6	11.6	61.6	15.4	..	..	1 503.3	8.7
1978-79	505.1	2.5	425.7	7.7	227.8	0.4	345.5	5.8	68.3	10.9	..	..	1 572.4	4.6
1979-80	476.3	-5.7	443.5	4.2	217.0	-4.7	362.8	5.0	63.5	-7.0	..	..	1 563.0	-0.6
1980-81	457.3	-4.0	420.5	-5.2	202.4	-6.7	366.1	0.9	55.3	-12.9	10.4	..	1 512.0	-3.3
1981-82	441.0	-3.6	412.6	-1.9	196.7	-2.8	375.4	2.5	75.6	36.7	47.2	353.8	1 548.5	2.4
1982-83	482.1	9.3	360.9	-12.5	186.1	-5.4	387.1	3.1	76.8	1.6	78.2	65.7	1 571.2	1.5
1983-84	630.4	30.8	378.5	4.9	190.4	2.3	391.2	1.1	86.1	12.1	85.3	9.1	1 761.9	12.1
Average annual growth rate (per cent)														
1969-70 to 1983-84		5.9		2.1		0.9		5.3		10.3		..		4.4
1976-77 to 1983-84		5.4		0.1		-1.5		4.2		7.1		..		3.5

a. Passengers paying any fare. Uplift-discharge patronage figures.
b. Airlines of WA became Ansett WA in 1985.
c. Connair ceased operations in May 1980, Northern Airlines commenced June 1980 and ceased February 1981, Airlines of Northern Australia commenced operations April 1981.
d. Bush Pilots Airlines became Air Queensland in November 1980.
e. Total includes Qantas (Norfolk Island) from 1969-70 to 1976-77 of between 13 000 and 22 000 passengers per annum and Ansett Flying Boat (Lord Howe Island) from 1969-70 to 1973-74 of between 8000 and 10 000 passengers per annum.

.. Not applicable.

Note Prior to 1 July 1982 EWA reported only those passengers paying 25 per cent or more of the standard fare. Statistics are now supplied in accordance with the standard definition.

Sources DoT (1982b). DofA (1985a).

EWA's strong growth in 1983-84 was due largely to the introduction and expansion of interstate services such as the introduction of the Sydney-Albury/Albury-Melbourne and Sydney-Canberra routes in March and June 1983 respectively. In addition, strong growth was achieved on the Sydney-Coolangatta and the Sydney-Newcastle/Newcastle-Brisbane routes and on routes to Tasmania.

Table 2.3 presents trends in NSW intrastate regional airline patronage for the period 1976-77 to 1983-84. The table shows that total intrastate regional airline patronage declined from 769 000 to 617 000 passengers over the past eight years, representing an average annual decline of 3.1 per cent.[4] EWA declined from 392 000 to 286 000 passengers and ANSW from 376 000 to 331 000 making ANSW the larger intrastate regional airline in 1983-84.

REGIONAL AIRLINE FARES

This section reviews recent trends in fares for the four larger regional airlines: EWA, ANSW, AWA and ASA. The other regional airlines (AIRQ and ANA) accounted for less than 10 per cent of the total regional market and were not included in the fare analysis.

Air fares

For the sample of 31 regional routes, operated by the four larger regional airlines, the weighted average total real air fare index increased by 25.9 per cent from 1977 to 1984 reflecting an average annual growth rate of 3.3 per cent. This compares with the trunk airline real air fare increase, according to air fare formula changes, over the same period of 37.3 per cent (which is 44 per cent above the regional airline industry average increase).

Figure 2.3 presents weighted average indices of real air fares for the four larger regional airlines on a quarterly basis from 1977 to 1984.[5] A notable feature of the regional airline intrastate fares shown in the figure is that the real fare increase for AWA was significantly lower than the other regional airlines. While EWA, ANSW and ASA all had average real fare increases for intrastate operations of between

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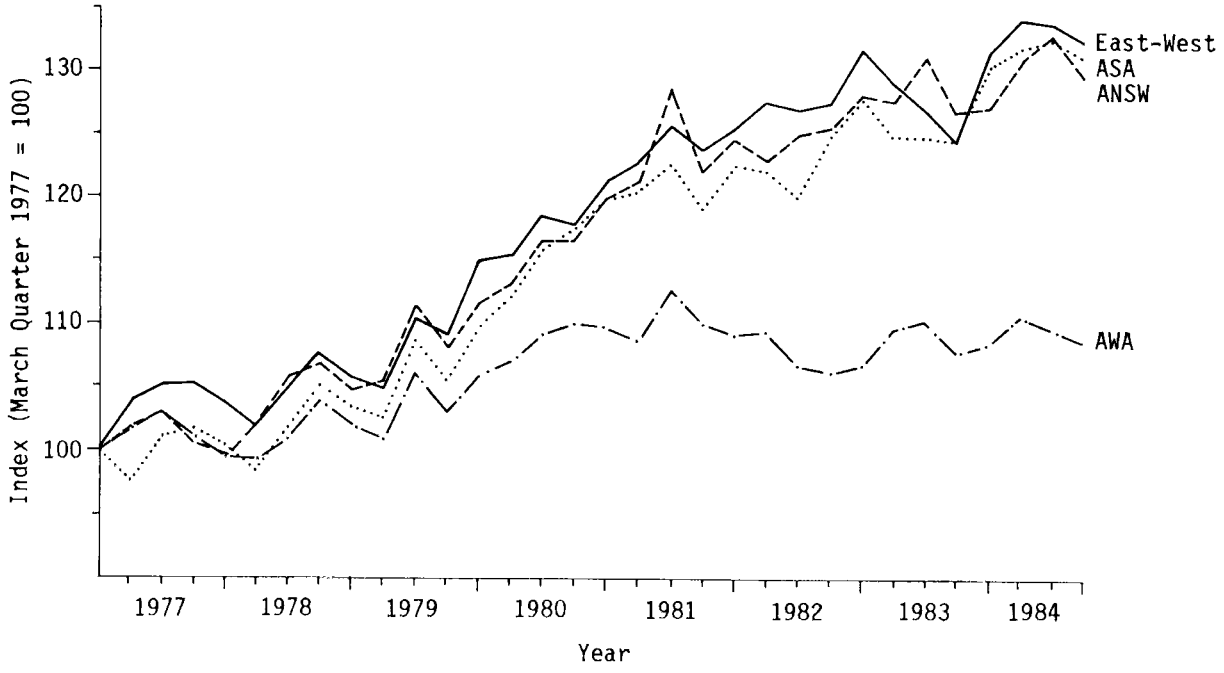
4. Intrastate New South Wales regional services in this analysis exclude services provided on trunk routes such as Sydney-Canberra and services to Norfolk Island, but include intrastate patronage for the Sydney-Albury route.
5. Appendix V discusses the fare increases for each route and the derivation of the weighted average total fares for each airline.



Source Derived from sample of routes.

Figure 2.3 Regional economy real air fare indices, 1977–84

TABLE 2.3 REGIONAL NEW SOUTH WALES INTRASTATE REVENUE PASSENGERS[a], 1976-77 TO 1983-84

	ANSW			*EWA*			*Total*	
Year	*Revenue passengers ('000)*	*Annual change (per cent)*	*Market share (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*	*Market share (per cent)*	*Revenue passengers ('000)*	*Annual change (per cent)*
1976-77	376.3	..	49.0	392.4	..	51.0	768.7	..
1977-78	395.1	5.0	48.0	428.8	9.3	52.0	823.9	7.2
1978-79	425.6	7.7	50.0	426.2	-0.6	50.0	851.8	3.4
1979-80	434.1	2.0	51.6	406.7	-4.6	48.4	840.7	-1.3
1980-81	405.3	-6.6	51.9	376.2	-7.5	48.1	781.5	-7.0
1981-82	392.2	-3.2	54.8	323.6	-14.0	45.2	715.8	-8.4
1982-83	339.7	-13.4	56.2	265.1	-18.1	43.8	604.8	-15.5
1983-84	331.5	-2.4	53.7	285.9	7.8	46.3	617.3	2.1
Average annual growth rate (per cent)								
1976-77 to 1983-84		-1.8			-4.4			-3.1

a. Intrastate routes excluding Sydney-Canberra, Sydney-Norfolk Island but including Sydney-Albury intrastate passengers.

.. Not applicable.

Note Prior to 1 July 1982 EWA reported only those passengers paying 25 per cent or more of the standard fare. Statistics are now supplied in accordance with the standard definition.

Source BTE estimates.

29.7 and 32.0 per cent, AWA real fares increased by only 9.7 per cent between the March quarter 1977 and the December quarter 1984. This variation in real air fare increases is due largely to the fact that the majority of AWA routes are long-haul routes in nature (average kilometres per revenue passenger in 1984 were AWA 1141, EWA 572, ANSW 497 and ASA 251). If the two sample routes under 1000 kilometres in Western Australia are used for comparison the result is a weighted average fare increase of 22.8 per cent over the period (see Table V.1).

In September 1982 the regulatory pricing bodies dealing with AWA (that is, the IAFC and the Western Australia Transport Commission (WATC)) determined that the flagfall component of the AWA air fare formula was understated. Subsequently the flagfall component was increased by 31.7 per cent and the distance component by only 1.4 per cent. The result was to reduce the rate of increase for long-haul routes versus short-haul routes over the subsequent period for AWA.

COMMUTER AIR TRAVEL MARKET

The commuter air travel market involves those routes where aircraft up to 38 seats or 4200 kilogram maximum payload are used for regular passenger transport (RPT) operations. Commuter operators provide feeder services to trunk route operations as well as providing RPT services to rural areas and to smaller communities near major metropolitan centres. Commuter services were formalised in 1967 and initially operators were restricted to aircraft with capacity limited to 18 seats. In 1980 this restriction was relaxed to 30 seats or 2500 kilogram capacity and the current regulations were introduced in February 1983.

Commuter airline patronage

Commuter services have become a significant part of aviation in Australia, particularly in terms of the number of operators and the number of ports served. In 1969-70, 20 commuter operators served 200 aerodromes, and during 1983-84, 50 operators served 297 ports. Table 2.4 shows that the number of revenue passengers for commuter operators increased from 108 000 to 955 000 over the 14-year period, which represents an average annual growth rate of 16.9 per cent. In 1983-84 commuter uplift-discharge data represented 8.3 per cent of the total domestic air passenger market compared to 1.8 per cent in 1969-70.

The overall growth of commuters between 1969-70 and 1983-84 can be attributed to both traffic growth on some existing routes and to the

TABLE 2.4 COMMUTER AIRLINE MARKET, TOTAL REVENUE PASSENGERS[a], 1969-70 TO 1983-84

Year	*Revenue passengers*	*Annual change (per cent)*	*Operators (number)*	*Annual change (per cent)*
1969-70	107 657	..	20	..
1970-71	104 292	-3.1	22	10.0
1971-72	110 664	6.1	25	13.6
1972-73	131 755	19.1	28	12.0
1973-74	205 424	55.9	26	-7.1
1974-75	277 565	35.1	29	11.5
1975-76	332 788	19.9	36	24.1
1976-77	418 088	25.6	43	19.4
1977-78	502 695	20.2	50	16.3
1978-79	602 702	19.9	54	8.0
1979-80	700 503	16.2	57	5.6
1980-81	827 115	18.1	62	8.8
1981-82	964 091	16.6	59	-4.8
1982-83	974 623	1.1	62	5.1
1983-84	955 141	-2.0	50	-19.4
Average annual growth rate (per cent)				
1969-70 to 1983-84		16.9		6.8
1976-77 to 1983-84		12.5		2.2

a. Passengers paying any fare. Uplift-discharge patronage figures.

.. Not applicable.

Sources DoT (1982c). DofA (1985b).

establishment of new routes by existing operators and by new operators. The growth of some commuter operators has also involved the takeover of several routes formally operated by regional airlines (for example, those between Sydney-Bathurst/Orange/Parkes/Cowra).

Despite the general growth over the period in the commuter market, both the number of commuter operators and the total commuter traffic declined in 1983-84 while strong growth occurred for regional

airlines.[6] The decline in commuter patronage statistics in 1983-84 was due to a number of factors including route change-overs from commuter to regional airline status by AIRQ (since 1982) and the takeover and mergers of some operators. However, the introduction of the 'two pilot' rule for 10 seater commuter aircraft operations in 1983 may also have contributed to increased costs and the consequent withdrawal of services by some operators.

COMMUTER AIRLINE FARES

Commuter fares, unlike those for trunk and regional air services, are not determined by a specific formula, although approval for the setting of fares is required from the IAFC.

Table 2.5 presents weighted average real fare increases for commuter routes by State of operation. The reported fare increases are for the period March quarter 1977 to December quarter 1983, with the exception

TABLE 2.5 COMMUTER AIRLINES, REAL FARE INCREASES FOR SAMPLE OF ROUTES BY STATE, MARCH QUARTER 1977 TO DECEMBER QUARTER 1983
(per cent)

State	*Real fare increase*
New South Wales	12.2
South Australia[a]	1.2
Western Australia	2.1
Queensland	31.2
Victoria[b]	17.1
Tasmania	37.6

a. Increase for March quarter 1979 to December quarter 1983.
b. Increase for March quarter 1977 to December quarter 1982.

Source BTE estimates.

6. The number of commuter operators was greatest in 1980-81 and 1982-83 where 62 airlines reported operations during those years versus 50 operators in 1983-84. Furthermore, only 44 commuter airlines were operating as at 30 June 1984 (DofA 1984). Recent provisional data for 1984-85 report 47 commuters operating as at 30 June 1985.

of South Australia and Victoria. The South Australian increase is for the period March quarter 1979 to December quarter 1983 and the Victorian figure is for the period March quarter 1977 to December quarter 1982. It is not clear what the underlying causes of the observed wide variation in real commuter fares are; however, these differences relate to factors such as the level of competition, route lengths and particular aspects of each State's commuter market.

TRUNK AIRLINE FREIGHT

The two major domestic airlines (Ansett and TAA) carry freight on scheduled passenger flights (mixed configuration), dedicated freight aircraft (all cargo) and on non-scheduled freight charters. Historical data are available only for the first two of these categories of freight carriage.

Table 2.6 shows the total tonnes of freight carried by trunk airlines for the period 1969-70 to 1983-84. The total freight uplifted in 1983-84 of 132 000 tonnes is below the freight carriage peaks of 1979-80 (133 000) and 1981-82 (137 700).

The negative growth in the all-cargo market is partly a result of reduced reliance on dedicated freight aircraft by the airlines since the introduction of wide-bodied jets and also the movement of some TAA freight by chartered freight carriers such as IPEC, Wards and AirTas. TAA's share of trunk airline total freight tonnes has consequently fallen from 50 per cent in 1981-82 to 44 per cent in 1983-84. However, if the 17 866 tonnes of freight TAA chartered via IPEC and other freight carriers is included for 1983-84, TAA's freight market share of the two trunk airlines is still approximately 50 per cent.[7]

While the growth in freight tonnes for the trunk airlines has been moderate, at 2.8 per cent per annum, the annual increase in tonne-kilometres has been marginally higher, averaging 3.6 per cent from 1969-70 to 1983-84. This suggests that the airlines have been increasing their carriage of freight on long-hauls at a higher rate than on short-hauls; the average distance for freight carriage being 1000 kilometres in 1983-84 versus 893 kilometres in 1981-82.

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7. In 1983-84 TAA chartered several freight carriers while Ansett largely carried its own freight. Since IPEC Aviation began licensed airline cargo operations in March 1982 it has become a significant airline freight carrier. In 1983-84 IPEC carried 26 000 tonnes of freight which represented 16.5 per cent of total Ansett, TAA and IPEC airline freight operations.

TABLE 2.6 TRUNK AIRLINE MARKET, FREIGHT UPLIFTED, 1969-70 TO 1983-84
('000 tonnes)

	Revenue freight			*Mail*			
Year	*Mixed configuration*	*All-cargo*	*Total*	*Mixed configuration*	*All-cargo*	*Total*	*Total freight*
1969-70	49.5	31.9	81.4	7.5	1.1	8.6	90.0
1970-71	53.2	28.5	81.6	7.6	1.2	8.8	90.4
1971-72	55.8	25.3	81.2	7.9	1.0	8.9	90.1
1972-73	58.0	28.2	86.3	7.8	1.1	8.9	95.2
1973-74	69.3	35.0	104.3	8.0	1.0	9.0	113.3
1974-75	66.8	32.5	99.3	7.6	1.0	8.6	107.9
1975-76	66.2	30.3	96.5	7.7	0.9	8.6	105.1
1976-77	66.9	31.5	98.4	7.5	0.9	8.4	106.8
1977-78	77.7	32.8	110.5	9.5	1.0	10.5	121.0
1978-79	80.6	34.5	115.1	10.6	1.1	11.7	126.8
1979-80	84.0	35.3	119.4	12.7	0.9	13.6	133.0
1980-81	77.9	37.4	115.3	14.5	1.3	15.8	131.1
1981-82[a]	85.1	37.4	122.5	14.3	1.0	15.2	137.7
1982-83[a]	82.3	28.4	110.8	14.5	0.7	15.2	126.0
1983-84[a]	85.2	30.8	116.1	15.7	0.2	16.0	132.0
Average annual growth rate (per cent)							
1969-70 to 1983-84	4.0	-0.3	2.6	5.4	-11.5	4.5	2.8
1976-77 to 1983-84	3.5	-0.3	2.4	11.1	-19.3	9.6	3.1

a. Excludes IPEC cargo-only operations. IPEC Aviation, which commenced airline operations in March 1982, is licenced to carry cargo only. Freight tonnage not included in trunk freight totals are 1981-82 (5094) 1982-83 (23 296) and 1983-84 (26 023).

Note Due to rounding, figures may not add to totals.

Sources DoT (1982b). DofA (1985a).

REGIONAL AND COMMUTER AIRLINE FREIGHT

Regional and commuter airline freight data are presented in Table 2.7 for the period 1969-70 to 1983-84. The table indicates that freight

TABLE 2.7 REGIONAL AND COMMUTER AIRLINE MARKETS, FREIGHT UPLIFTED, 1969-70 TO 1983-84

(tonnes)

Year	Regional			Commuter			Total freight uplifted
	Freight	*Mail*	*Total*	*Freight*	*Mail*	*Total*	
1969-70	10 524	1 186	11 709	517	68	585	12 294
1970-71	11 129	1 259	12 387	593	60	653	13 041
1971-72	10 404	1 364	11 767	599	68	667	12 434
1972-73	9 708	1 426	11 134	711	69	780	11 914
1973-74	10 858	1 335	12 193	1 330	125	1 455	13 648
1974-75	10 742	1 351	12 093	1 765	139	1 904	13 997
1975-76	12 526	1 273	13 799	2 030	143	2 173	15 972
1976-77	9 813	1 163	10 976	2 467	184	2 651	13 627
1977-78	10 427	1 257	11 684	2 865	215	3 080	14 764
1978-79	10 425	1 408	11 833	2 909	284	3 193	15 026
1979-80	10 404	1 430	11 835	3 150	335	3 485	15 320
1980-81	9 624	1 531	11 156	3 455	424	3 879	15 035
1981-82[a]	8 661	1 631	10 292	3 635	507	4 142	14 434
1982-83[a]	7 772	1 569	9 341	3 477	453	3 930	13 271
1983-84[a]	7 799	1 606	9 405	3 251	396	3 647	13 052
Average annual growth rate (per cent)							
1969-70 to 1983-84	-2.1	2.2	-1.6	14.0	13.4	14.0	0.4
1976-77 to 1983-84	-3.2	4.7	-2.2	4.0	11.6	4.7	-0.6

a. IPEC Aviation, which commenced licenced airline operations in March 1982, is licenced to carry cargo only. Tonnes freight not included in regional freight or totals are for 1981-82 (5094), 1982-83 (23 296) and 1983-84 (26 023).

Sources DoT (1982b, 1982c). DofA (1985a, 1985b).

and mail carried by regional airlines (excluding IPEC freight-only operations) has declined steadily since the mid-1970s and in 1983-84 was 20 per cent lower than in 1969-70. Combined regional freight and mail in 1983-84 was approximately 9400 tonnes and the regional freight market average annual growth rate over the 14 years was -2.1 per cent.

Commuter freight and mail grew steadily over the period at an average rate of 14.0 per cent per annum. Total commuter freight and mail was 3647 tonnes in 1983-84 which was 28 per cent of the total regional and commuter freight market in that year. However, total regional and commuter freight uplifted (excluding IPEC) in 1983-84 was 13 052 tonnes which represented only 7.6 per cent of the domestic air freight market in 1983-84 of 171 075 tonnes.

CHAPTER 3 FACTORS AFFECTING DEMAND FOR AIR PASSENGER SERVICES

There are a number of factors that affect demand for air passenger services on a particular route. These include:

- air fares, relative to the prices of other goods and services which compete with air travel for the consumer's dollar;
- prices of alternative modes of transport, namely car, coach and train (and ship in the case of travel to Tasmania);
- non-price criteria such as the quality of service provided by air transport relative to other modes (for example availability and frequency of service, travel time involved, comfort and safety); and
- the socio-demographic characteristics of travellers and the level of economic activity in the route catchment areas, measured by, for example, population, disposable incomes, and particular local activities such as tourism and major developments in mining and power generation.

The discussion below presents the factors affecting demand in more detail. Although there may be market or specific route factors affecting demand, the most important general factors relevant to the three markets (that is, trunk, regional and commuter) were selected for the empirical analysis reported in Chapter 4.

RELATIVE COST OF AIR TRAVEL

It is anticipated that there will be an inverse relationship between air fares and the demand for air services.[1]

Ideally, the relative cost of air travel should be examined by comparing air fares and the prices of all competing goods. For example, leisure travel by air is competitive with purchases of

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1. In the empirical analysis the standard one way economy fare was assumed to be representative of the cost of air travel.

consumer durables or a non-flying holiday. The substitutes for business air travel are less obvious but some, such as greater use of telecommunications, do exist. Generally, it is impractical to identify all competing goods in demand analysis, so a deflator is commonly used to maintain parity between the cost of air travel and the prices of other goods and services. The price deflator used in this Paper is the Australian Bureau of Statistics (ABS) implicit deflator for gross domestic non-farm product. In this manner an indication of relative movements of air fares is obtained.

Purpose of travel

It can be hypothesised that the responsiveness of air travellers to fare changes will vary according to passenger characteristics.[2] Hence, it would be desirable to disaggregate demand by purpose of travel (for example business, non-business) and applicable fares. However, the information needed to do this on an individual route basis is not available and therefore it was not possible to explicitly account for pupose of travel in the analysis.[3]

Length of trip

It might be expected that demand on short routes would be more price responsive than for longer journeys due to the greater scope for substitution between modes of transport. However, as mentioned above, there are a number of possible substitutes for long-haul air travel such as alternative destinations, other goods or services and the use of telecommunications. In addition, on long-haul routes the absolute fare level after a fare increase may preclude travel on the basis of budgetary considerations. For analytical purposes the sample of trunk

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2. The wider range of fares offered on trunk routes by the airlines has essentially divided the market into various segments according to fare type. A recent BTE study (1985a) indicated that full fare TAA and Ansett passengers were essentially middle aged business travellers with medium to high incomes. In contrast TAA and Ansett discount passengers were essentially private travellers and there was a higher proportion of low income earners. East-West passengers exhibited similar characteristics to trunk airline discount travellers.
3. An earlier study by the BTE (1981a) relating to non-urban travel to a destination greater than 100 kilometres away from home revealed some interesting facts. Travel for business purposes amounted to 16 per cent of all trips. Of these business trips, 16 per cent were by air, 64 per cent by car, 18 per cent by other (mainly trucks) and an almost negligible share by bus and train. The study results also indicated that about 40 per cent of air travel was for business purposes. Of the trips for non-business purposes, air travel accounted for 5 per cent or less in each category.

routes was divided into three distance categories. The sample of New South Wales regional and commuter routes was also sufficiently large to enable an analysis of short-haul and long-haul routes. In all other States the analysis was on the basis of State of operation.

INCOME

It is expected on *a priori* grounds that income will have a positive influence on air travel, particularly in the case of non-business travel. In the case of traffic from most regional centres to capital cities, the average income in the catchment area of the country town is the relevant determinant of demand. However, for some country areas the reverse is true; for instance holiday resorts attract traffic from elsewhere and consequently income should be measured over a much broader geographical range.

The income variable used in the demand analysis of trunk and regional air services was gross domestic product (GDP). Average weekly earnings, being a more disaggregate measure of income, was considered to be more suitable for the analysis of commuter traffic. Both measures of income were expressed in real terms.

POPULATION

Demand for air travel on a given route is assumed to be related to the population in the catchment area for that route. For individual trunk routes the aggregrate population of each city-pair was used in the empirical work. Population was measured on a regional basis for the analyses of regional and commuter traffic, reflecting the importance of local factors in determining demand for these air services.

ALTERNATIVE MODES OF TRANSPORT AND ASSOCIATED COSTS

Alternative transport modes to air are available on all air passenger routes. In practice, the degree of intermodal competition depends on the purpose of travel, length of trip and the associated travel costs and travel times. Long distance travel tends to favour air travel on the basis of cost per kilometre and travel time.[4] Over equivalent distances, costs for car travel can accumulate rapidly for items such

4. Over long distances the flagfall component of an air fare as a proportion of the total fare decreases. Given that the distance component of trunk and regional air fare formulae does not increase according to distance this has the effect of lowering the cost of long-haul air travel on a per kilometre basis.

as vehicle repairs, meals and accommodation. Savings in travel time by air as opposed to car, coach, rail or sea travel increase dramatically as distances increase.

Competition between road and air is also influenced by road quality. Substantial upgrading of national roads and rural arterials, assisted by the construction program under the Australian Bicentennial Road Development Program (ABRD), would be expected to affect competition partly through reducing car and coach travel times and also through other benefits to travellers in the way of comfort and safety.

It is not possible to quantify all aspects of cost and service quality factors affecting competition between air and other modes for an empirical analysis of air transport demand. Since the car is the major competitor with air, the perceived cost of car travel, as represented by an index of petrol prices in real terms, was used in the analysis to measure the influence of car travel. The cost of coach travel (fares) was included where appropriate with respect to travel on long-hauls. Coach travel is particularly relevant on those routes between the capital cities in the eastern States where an extensive coach network operates. For those routes to Tasmania the cost of sea travel was included.

OTHER FACTORS

Employment

Another indicator of the level of economic activity is the number of people employed. Changes in income and employment are closely related. Thus it was considered sufficient to only include income in the empirical analysis.

Tourist accommodation

For major tourist resort centres, an estimate of tourist accommodation in hotels and motels with licensed facilities can be calculated. This is regarded as a reliable indicator of tourist activity in an area. However, since it was not possible to distinguish between tourist and non-tourist journeys, this factor was not included in the analysis.

Industrial disputes

Industrial disputes have exerted significant periodic effects on both trunk and regional airlines.

The number of stoppages varied considerably from year to year. On average, all routes have been affected by major stoppages and both trunk and regional airlines have been affected by a number of disputes of varying length.

Although industrial disputes can have a significant temporary impact on patronage, the long term effect on trends in patronage is likely to be limited. This fact, combined with the unpredictable nature of most disputes, decreases the usefulness of incorporating industrial stoppages into an empirical demand analysis.

Major stoppages of an industrial nature during the study period are given in Appendix VIII.

CHAPTER 4 EMPIRICAL ANALYSIS

Chapter 3 identified the factors affecting demand for passenger air services in Australia. The main objective of the empirical analysis reported in this chapter was to quantify the effects of socio-economic factors affecting demand.

DEMAND AND SUPPLY MODEL

To represent market structural relationships by a single equation it is necessary to assume that the responsiveness, or elasticity, of supply to price is either completely responsive (elastic) or completely non-responsive (inelastic) to price changes in the short-run.

The market structure will reduce to a single equation relating the quantity sold to the price of the commodity or service (among other factors) when supply is completely elastic in the short-run and the commodity or service price is fixed by some regulatory body. In these circumstances demand fluctuations are met through inventory changes or by the use of close substitute services. This single market behavioural function approximates the economist's demand curve and indicates consumer reaction to variations in the explanatory factors in general, and to price variations in particular.

For the domestic aviation markets it is considered appropriate to adopt the assumption that the supply of air services is completely elastic in the short-run. On any route, airlines can generally increase the utilisation of existing aircraft or increase the number of aircraft by diversion of other aircraft to meet short-run demand fluctuations.

METHODOLOGY

Demand relationships were estimated for three separate markets of domestic air travel using a selected sample of trunk, regional and commuter routes. Aggregate demand models were estimated for each market using time series data between the March quarter 1977 and

December quarter 1984.[1] The method involved simultaneously relating changes in passenger flows over routes and over time to the corresponding changes in the explanatory variables, that is, the socio-economic and other factors affecting demand. In general all variables, with the exception of seasonal and specific route dummies, were measured in natural logarithms. The 'double-log' specification implies constant or average elasticities.[2]

TRUNK ROUTES

Estimation procedure

Demand relationships for trunk air services were estimated as a function of the aggregate population of each city-pair, seasonal and/or service quality dummy variables and the real values for air fare, income and the price of alternative transport. Alternative transport included car and coach travel, regional air travel as appropriate, and sea transport for Tasmanian routes.

As mentioned in Chapter 1, uplift-discharge data are not well suited for the estimation of regression models where service patterns changed significantly during the study period. The method used in the empirical analysis to adjust for these changes in service patterns was to introduce a dummy variable for the period following the introduction of a service change. The results for routes which were affected by service pattern changes (particularly those routes from the eastern capital cities to Perth) should be treated with caution because of this estimation procedure. An alternative approach considered was to estimate an aggregate regression model for travel to Perth from the eastern capital cities; however, a major difficulty with this approach is assigning 'average' values to the explanatory variables.

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1. Commuter uplift-discharge data were generally only available for the period March quarter 1977 to December quarter 1983.
2. Mathematically, the functional form of the demand relationship is:

   $d = k\ x_1^{\alpha}\ x_2^{\beta}$

   where x_1, x_2 are the explanatory variables, k is a constant and d the demand, while α, β are elasticities. To obtain a linear relationship, this equation was subjected to logarithmic transformation, and a least-squares regression technique was used to determine the elasticities. Cochrane-Orcutt correction for serial correlation was applied to time series models when first order serial correlation was present. Pooled cross-section demand models subject to serial correlation were re-estimated by the full cross-sectionally correlated and time-wise autoregressive model (see Kmenta 1971, 512-14).

Individual demand relationships were estimated for 30 competitive trunk routes which represented over 94 per cent of total trunk airline travel in 1984 (see Appendix 1). In addition, individual routes were grouped into five sub-markets on the basis of homogeneity with regard to the factors affecting demand as follows:

- Group 1 - short-haul routes (seven routes representing 55 per cent of trunk airline passengers);
- Group 2 - medium-haul routes (eight routes representing 15 per cent of trunk airline passengers);
- Group 3 - long-haul routes (six routes representing 9 per cent of trunk airline passengers);
- Group 4 - 'summer holiday' routes (five routes between Tasmania and the mainland characterised by a large proportion of leisure travel which represent 10 per cent of trunk airline passengers); and
- Group 5 - 'winter sunspots' routes (four leisure dominated routes between Queensland holiday destinations and southern State capitals which represent 6 per cent of trunk airline passengers).

Results

On the whole, the estimated regression models provided good explanations of the quarterly variations in trunk air travel. All of the estimated elasticities for air fare and income were of the expected signs. Further, the demand elasticities appeared to have a consistent pattern with respect to the derived sub-markets. For the purpose of comparing elasticity estimates across routes, error limits were not considered specifically in this Paper. Appendix IX contains examples of fare elasticity confidence intervals for the sample of short-haul trunk routes.

Results of the empirical analysis for the individual routes and for the five sub-markets are summarised in Tables 4.1 and 4.2 respectively. Details of the empirical work are reported in Tables VI.1 and VI.2 of Appendix VI. Some observations that can be made from the four tables are as follows:

- For the two highest density direct links between the three major eastern capital cities, Melbourne-Sydney and Sydney-Brisbane, where business travel is expected to be important, the fare elasticities were -0.30 and -0.36 respectively (that is, inelastic).
- Air fare elasticity on non-holiday routes appears to increase in

TABLE 4.1 FARE AND INCOME ELASTICITIES FOR INDIVIDUAL TRUNK ROUTES

Route (distance in brackets)	*Real air fare*	*Real income*
Short-haul routes (less than 800 km)		
Sydney-Canberra (237)	-0.49	0.34
Townsville-Cairns (283)	-0.47	0.96
Melbourne-Canberra (470)	-0.43	1.16
Brisbane-Rockhampton (520)	-0.79	0.60
Melbourne-Adelaide (643)	-1.17	3.43
Sydney-Melbourne (707)	-0.30	0.96
Sydney-Brisbane (747)	-0.36	0.62
Medium-haul routes (800-1700 km)		
Brisbane-Canberra (951)	-0.91	1.00
Adelaide-Canberra (972)	-0.80	0.57
Brisbane-Townsville (1114)	-0.26	0.75
Sydney-Adelaide (1166)	-0.79	0.92
Adelaide-Alice Springs (1316)	-0.98	1.63
Melbourne-Brisbane (1376)	-1.36	2.36
Brisbane-Cairns (1392)	-0.62	1.36
Brisbane-Mt Isa (1572)	-1.40	1.74
Long-haul routes (over 1700 km)		
Adelaide-Perth (2120)	-0.44	0.87
Adelaide-Darwin (2619)	-1.01	1.03
Melbourne-Perth (2707)	-1.05	1.99
Sydney-Darwin (3154)	-2.59	4.85
Sydney-Perth (3284)	-3.54	2.52
Brisbane-Perth (3611)	-0.93	1.26
'Summer holiday' (Tasmania)		
Melbourne-Devonport (412)	-0.19	1.01
Melbourne-Launceston (476)	-0.43	0.79
Melbourne-Hobart (617)	-1.29	1.49
Sydney-Launceston (915)	-0.86	1.24
Sydney-Hobart (1040)	-1.28	2.87

TABLE 4.1 (Cont.) FARE AND INCOME ELASTICITIES FOR INDIVIDUAL TRUNK ROUTES

Route (distance in brackets)	*Real air fare*	*Real income*
'Winter sunspots' (Queensland)		
Sydney-Coolangatta[a] (679)	-0.62	0.64
Melbourne-Coolangatta (1330)	-1.28	2.07
Sydney-Townsville (1689)	-2.54	3.66
Sydney-Cairns (1970)	-1.33	3.19

a. The cross-price elasticity with respect to regional air fare is 1.50.

Source BTE estimates.

TABLE 4.2 ELASTICITIES OF DEMAND FOR TRUNK ROUTES BY SUB-MARKET

Sub-market	*Real air fare*	*Real income*	*Real price of alternative transport*
Short-haul	-0.55	0.92	0.35
Medium-haul	-0.73	1.38	0.51
Long-haul	-0.82	1.37	0.26
'Summer holiday' (Tasmania)	-1.45	1.70	0.68
'Winter sunspots' (Queensland)	-2.37	1.70	..

.. Not applicable.

Source BTE estimates.

absolute terms with the length of the route suggesting income effects. That is, the cost of travel becomes sufficiently high that changes in air fares affect a travellers' total budget and result in significant changes in the decision of whether or not to travel by air on long-haul routes.

- The importance of seasonal holiday travel to Queensland (peaks in winter) and Tasmania (peaks in summer) is reflected in the significance of the seasonal effect variables.

REGIONAL ROUTES

Estimation procedure

Demand for regional air services was expressed as being dependent on the population of the regional centre, seasonal dummy variables and the real values for air fare, income and the price of alternative transport (car, coach or commuter air travel as appropriate).

Demand equations were estimated for each State. For New South Wales equations were estimated for sub-markets according to distance, population and geographic characteristics and operator categories. Tables II.1 and II.2 in Appendix II contain a summary of the sampled routes within each group according to the above classification.

Results

Table 4.3 provides a summary of the elasticities of demand for regional air services. Details of the empirical work are presented in Table VI.3 of Appendix VI.

New South Wales

In addition to the State network equation, three classes of demand equations were estimated:

Distance

- routes up to 400 kilometres (short-haul)
- routes over 400 kilometres (long-haul).

Geographic and population characteristics

- routes to major regional centres
- routes to minor regional centres
- routes to the Central Coast area
- routes to the North Coast area.

Operator

- routes operated by ANSW
- routes operated by EWA.

TABLE 4.3 ELASTICITIES OF DEMAND FOR REGIONAL AIR SERVICES

State	*Real air fare*	*Real income*	*Regional population*	*Real price of alternative transport*
New South Wales				
Routes less than 400 km	-1.07	0.04	0.63	0.69
Routes greater than 400 km	-1.13	0.90	0.57	0.30
Major regional centres	-0.92	0.05	..	0.05
Minor regional centres	-1.33	1.09	..	0.44
Central Coast area	-0.94	0.34	0.53	0.24
North Coast area	-1.83	0.53	2.38	0.73
EWA	-0.74	0.41	..	..
ANSW	-1.63	0.73	0.71	0.52
Total New South Wales	-1.14	1.21	0.01	0.23
South Australia	-1.00	1.53	-0.14	0.94
Western Australia	-0.86	0.61	2.12	0.36
Queensland	-1.21	0.58	..	0.66

.. Not applicable.

Source BTE estimates.

The sample contained 18 New South Wales intrastate routes, consisting of nine ANSW routes and nine routes operated by EWA. Based on the results of the empirical work the following observations can be made:

- demand for air travel on both short-haul (less than 400 kilometres) and long-haul (greater than 400 kilometres) routes is responsive to changes in the real air fare (elasticity of about-1.1);
- although the price elasticity of alternative transport is inelastic for both short-haul and long-haul routes it is larger for short-haul routes, indicating the greater availability of and potential for substitution between transport modes on shorter routes;

- the demand response with respect to both income and alternative transport for the larger regional centres is low in comparison to travel to smaller country towns, possibly indicating that business travel is more important for routes to the larger regional cities;
- the high fare elasticity for travel to the North Coast indicates the potential for further expansion on these routes;
- demand for travel to the North Coast area is very responsive to population growth; and
- demand on ANSW routes is relatively more sensitive to air fare changes than on EWA routes, possibly indicating that passenger characteristics are different for the two operators.

South Australia

A sample of five routes operated by ASA was selected for the empirical analysis. From the estimated equation the following broad conclusions can be drawn:

- demand is very responsive to changes in income in comparison to other States (income elasticity of 1.53); and
- demand is responsive to changes in the price of alternative transport, indicating the presence of direct competition from commuter airlines in addition to competition from other modes.

Western Australia

Eight AWA routes, comprising six intrastate and two interstate routes, were used in the empirical work. From the results of the empirical analysis the following observation can be made:

- demand is relatively unresponsive to changes in air fares and the price of alternative transport probably reflecting the lack of suitable alternatives to regional air services as a result of the long distances involved on most regional routes in Western Australia.

Queensland

As the empirical work was based on only one AIRQ route, it is not possible to draw any general conclusions from the estimated equation; however, for completeness, the results of the empirical analysis were included.

COMMUTER ROUTES

Estimation procedure

For each of the six States, demand for commuter air services was

expressed as a function of the population of the centre served by the air service, seasonal dummy variables and the real values for air fare, male average weekly earnings in each State and the price of alternative transport.

Demand equations were estimated for commuter services according to the State of operation. In addition, the following equations were estimated:

New South Wales

- routes up to 200 kilometres (short-haul)
- routes over 200 kilometres (long-haul).

South Australia

- mainland services
- services to Kangaroo Island.

Details of the empirical analysis are presented in Table VI.4 of Appendix VI. Table 4.4 contains a summary of the elasticities of demand.

Results

From the empirical work the following observations can be made:

New South Wales

- demand for air travel on short-haul (less than 200 kilometres) routes is more than twice as responsive to changes in real air fares as demand on long-haul (greater than 200 kilometres) routes[3];
- demand is very responsive to income changes on short-haul routes and less responsive on long-haul routes; and
- there is some evidence of substitution between modes over shorter routes reflecting the existence of good quality rail and road networks.

South Australia

- the demand response to air fare changes is lower for services to Kangaroo Island than for mainland services; and

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3. This result should be treated with caution due to the different characteristics of the catchment areas, such as population, for the individual short-haul routes.

TABLE 4.4 ELASTICITIES OF DEMAND FOR COMMUTER AIR SERVICES

Sub-market	*Real air fare*	*Real income*[a]	*Regional population*	*Real price of alternative transport*
New South Wales				
Routes less than 200 km	-2.54	2.70	1.20	0.28
Routes greater than 200 km	-0.59	1.25	..	..
South Australia				
Kangaroo Island services	-0.60	2.98	1.97	0.27
Mainland services	-1.52	0.46	..	..
Western Australia	-1.96	0.31	..	1.86
Queensland	-0.81	0.88	..	0.12
Victoria	-0.23	0.24	3.59	0.30
Tasmania	-1.16	1.42	..	1.61

a. Real income in these equations was real male average weekly earnings.

.. Not applicable.

Source BTE estimates.

- demand for air travel to Kangaroo Island is very responsive to changes in both income and population.

Western Australia

- demand is very responsive to air fare changes; and
- demand is responsive to changes in the price of alternative transport reflecting the shorter route distances (and therefore greater potential for intermodal competition) for commuter services in Western Australia in comparison to regional services.

DOMESTIC AIR FREIGHT

Demand relationships for trunk, regional and commuter air freight were estimated as a function of the real air freight rate, real road freight rate, real income (as measured by GDP) retail sales and

seasonal dummy variables. Two variables, retail sales and the real road freight rate, did no feature in the final equations.

Results

A summary of the results is provided in Table 4.5. Details of the empirical work are presented in Table VI.5 of Appendix VI. Based on the results of the empirical work the following observations can be made:

- the demand response with respect to the real freight rate is low for all three freight markets;
- seasonality is an important factor in explaining the demand for trunk airline air freight as indicated by the significance of the seasonal dummy variables; and
- both trunk and commuter airline freight are responsive to changes in income.

TABLE 4.5 ELASTICITIES OF DEMAND FOR DOMESTIC AIR FREIGHT

Market	*Real freight rate*	*Real income*
Trunk[a]	-0.12	1.35
Regional[a]	-0.12	..
Commuter	-0.11	1.39

a. A dummy variable was used for the period of IPEC's operation.

.. Not applicable.

Note Trunk freight includes IPEC Aviation.

Source BTE estimates.

CHAPTER 5 SCENARIOS AND FORECASTS

In order to estimate the future expected levels of travel and freight demand for trunk, regional and commuter air services from the empirical relationships discussed in Chapter 4, it was necessary to project those factors found to influence demand. The future values assigned to these explanatory variables in the study were estimated from historical data and projections produced by other organisations.[1] The forecasts assume that there is no transfer of routes between operator classes or changes to the current regulatory arrangements.

SCENARIOS

Values were assigned to those factors affecting demand according to two scenarios for the future socio-economic environment. One scenario reflected future economic and demographic events which 'favour' high growth in air travel demand for the three passenger and freight markets, whilst the other assumed 'adverse' conditions. The basis of the assumptions underlying these two scenarios are briefly discussed in the following section and the levels assigned to the major explanatory variables are reported in Table 5.1.

Air fares

The most significant components of total airline operating costs are labour and fuel. For simplicity, in estimating future fare levels, expected changes in labour and fuel costs were postulated.

Changes in total operating costs were estimated assuming that costs other than labour and fuel remain constant in real terms. It was assumed that technological changes will lead to more fuel-efficient aircraft over the forecast period. Labour costs were projected to increase in line with male average weekly earnings. Gains in labour

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1. Information was obtained from organisations such as the Australian Bureau of Statistics (ABS), the National Institute of Economic and Industry Research (NIEIR), the National Institute of Labour Studies, the Department of Resources and Energy and the Department of the Treasury.

TABLE 5.1 PROJECTED GROWTH RATES OF MAJOR EXPLANATORY VARIABLES

(per cent per annum)

		Year[a]			
Variable	*Scenario*	*1985*	*1986-90*	*1991-95*	*1996-2000*
Air fares[b]					
Trunk	High growth	1.0	1.0	1.0	1.0
	Low growth	1.9	1.6	1.3	1.3
NSW regional	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
NSW short-haul commuter	High growth	0.0	0.0	0.0	0.0
	Low growth	1.0	0.6	0.6	0.6
NSW long-haul commuter	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
Vic commuter	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
Qld regional and commuter	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
SA regional	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
SA commuter	High growth	0.0	0.0	0.0	0.0
	Low growth	1.0	0.6	0.6	0.6
WA regional and commuter	High growth	0.0	0.0	0.0	0.0
	Low growth	1.0	0.6	0.6	0.6
Tas commuter	High growth	1.0	1.0	1.0	1.0
	Low growth	1.5	1.3	1.3	1.3
GDP[b]	High growth	4.5	3.0	2.5	2.0
	Low growth	4.0	2.5	2.0	1.5
Male average weekly earnings[b]	High growth	1.0	1.5	1.0	1.0
	Low growth	0.5	0.5	0.5	0.5
Population					
Aust	High growth	1.2	1.3	1.3	1.2
	Low growth	1.2	1.2	1.2	1.1
NSW	High growth	1.6	1.4	1.3	1.2
	Low growth	1.2	1.1	1.0	0.9
Vic	High growth	0.9	1.1	1.1	1.0
	Low growth	0.9	1.0	1.0	0.9

TABLE 5.1 (Cont.) PROJECTED GROWTH RATES OF MAJOR EXPLANATORY VARIABLES

(per cent per annum)

		Year[a]			
Variable	*Scenario*	*1985*	*1986-90*	*1991-95*	*1996-2000*
Qld	High growth	1.6	1.8	1.7	1.6
	Low growth	1.6	1.7	1.6	1.4
WA	High growth	1.7	1.9	1.9	1.7
	Low growth	1.7	1.8	1.7	1.5
SA	High growth	0.9	1.1	1.1	0.9
	Low growth	0.9	1.0	1.0	0.8
Tas	High growth	1.0	1.0	0.9	0.8
	Low growth	1.0	0.9	0.8	0.7
Cost of car travel[b]	High growth	2.0	1.0	1.0	1.0
	Low growth	1.0	0.0	0.0	0.0
Coach fares[b]					
Interstate	High growth	1.0	1.0	1.0	1.0
	Low growth	-3.0	-2.0	0.0	0.0
Intrastate	High growth	2.0	1.0	1.0	1.0
	Low growth	1.0	0.0	0.0	0.0
Sea fares[b]	High growth	1.0	1.0	1.0	1.0
	Low growth	-3.0	-2.0	0.0	0.0
Domestic air freight rates[b]	High growth	1.0	1.0	1.0	1.0
	Low growth	1.9	1.6	1.3	1.3

a. Year ending 31th December.
b. Real terms

productivity are expected to be small for domestic airlines, although this may be affected by future structural changes to the industry.

The high growth scenario for trunk and regional fares, with the exception of Western Australia , assumes small real increases throughout the forecast period.[2] Moderate fare increases were assumed

2. As mentioned in Chapter 2, AWA real fare increases have been significantly lower than increases for the other regional airlines. It was assumed that real fares would remain relatively constant throughout the forecast period.

for New South Wales long-haul commuter routes and for commuter routes in Queensland, Victoria and Tasmania under the high growth scenario. Commuter fares are expected to remain constant in real terms for New South Wales short-haul, South Australian and Western Australian routes under the high growth scenario.

Car and coach travel

On average, real fuel price increases are expected to be moderate throughout the forecast period. Interstate coach fares are expected to continue declining in the short term under the low growth scenario due to continuing competitive pressures. Intrastate coach fares are affected by State regulations which can mean that factors such as cross-subsidisation between routes and overall operator returns are important considerations in fare determination. It was assumed that intrastate coach fares will increase in line with forecast movements in operating costs. Small real increases in operating costs are expected under the high growth scenario.

Sea travel

For travel to Tasmania it was assumed that under the low growth scenario fares for sea travel would continue declining in the short term. Under the high growth scenario fares are assumed to increase moderately.

Income

The scenarios for income reflect the projections of economic forecasting organisations such as the National Institute of Economic and Industry Research (NIEIR). The longer term outlook is for moderate growth with a gradual tapering off in the 1990s.

Population

The source of the population projections to the year 2000 was ABS (1983a). In both high and low growth scenarios, the assumed values for fertility and mortality rates are similar. However, the main difference is in net migration gains. The projected population growth rates are shown in Table 5.1.

Air freight rates

It was assumed that air freight rates would move in line with total aircraft operating costs. Therefore the high growth scenario assumes small real increases in freight rates throughout the forecast period.

FORECASTS

Demand for air passenger and freight services in Australia were forecast from 1985 to 2000. The methodology was based upon the demand equations reported in Chapter 4 and the scenarios for the explanatory variables presented in Table 5.1. Projections of total revenue passengers were obtained by assuming the market samples were indicative of total patronage for each market segment.

Passenger forecasts

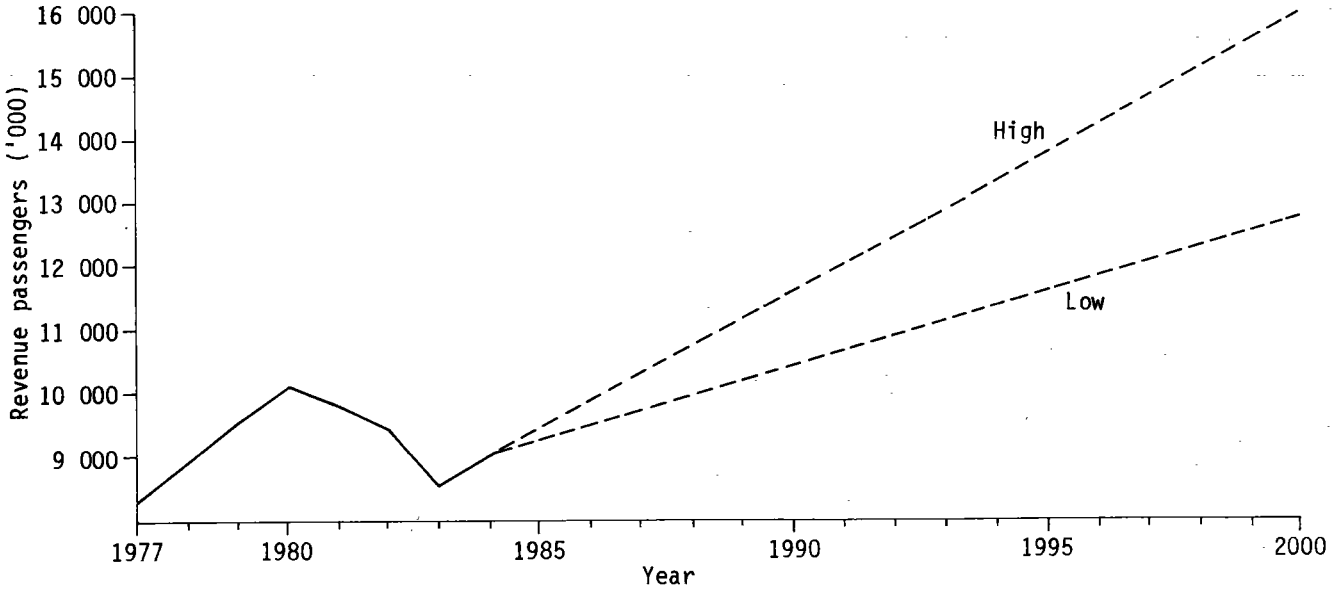
Tables 5.2 to 5.4 contain forecasts of the average growth rates for trunk, regional and commuter revenue passengers respectively. Figures 5.1 to 5.3 show forecasts of the level of patronage for the same period. For all three levels of air travel, growth is forecast to be lower in the 1990s than in the remainder of the 1980s, reflecting a tapering-off in growth rates at higher levels of activity towards the end of the century.

TABLE 5.2 FORECAST AVERAGE ANNUAL GROWTH RATES FOR TRUNK AIRLINE PASSENGERS, 1985 TO 2000

(per cent per annum)

		Year			
Routes	*Scenario*	*1985*	*1986-90*	*1991-95*	*1996-2000*
Short-haul					
(less than 800 km)	High	3.9	3.1	2.5	2.2
	Low	2.2	1.3	1.4	1.0
Medium-haul					
(800-1700 km)	High	6.4	4.2	3.6	2.9
	Low	4.7	2.7	2.4	1.7
Long-haul					
(over 1700 km)	High	8.5	6.0	5.0	3.8
	Low	5.9	2.9	2.6	1.6
'Summer holiday'					
(Tasmania)	High	5.2	3.3	2.7	2.1
	Low	3.0	1.5	1.6	0.9
'Winter sunspots'					
(Queensland)	High	10.8	8.7	8.2	7.3
	Low	9.3	7.1	7.0	6.3
All sample routes	High	5.3	4.0	3.5	3.1
	Low	3.5	2.2	2.2	1.8

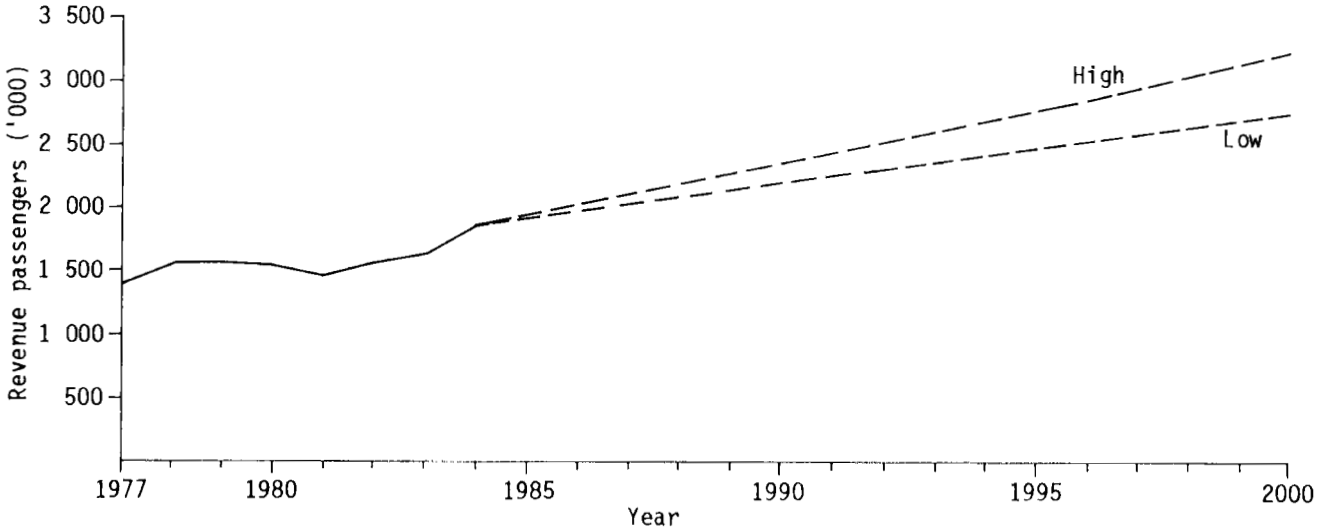
Source BTE estimates.



Note Actual revenue passengers, 1977-84.

Sources DoT (1982b). DofA (1985a). BTE estimates.

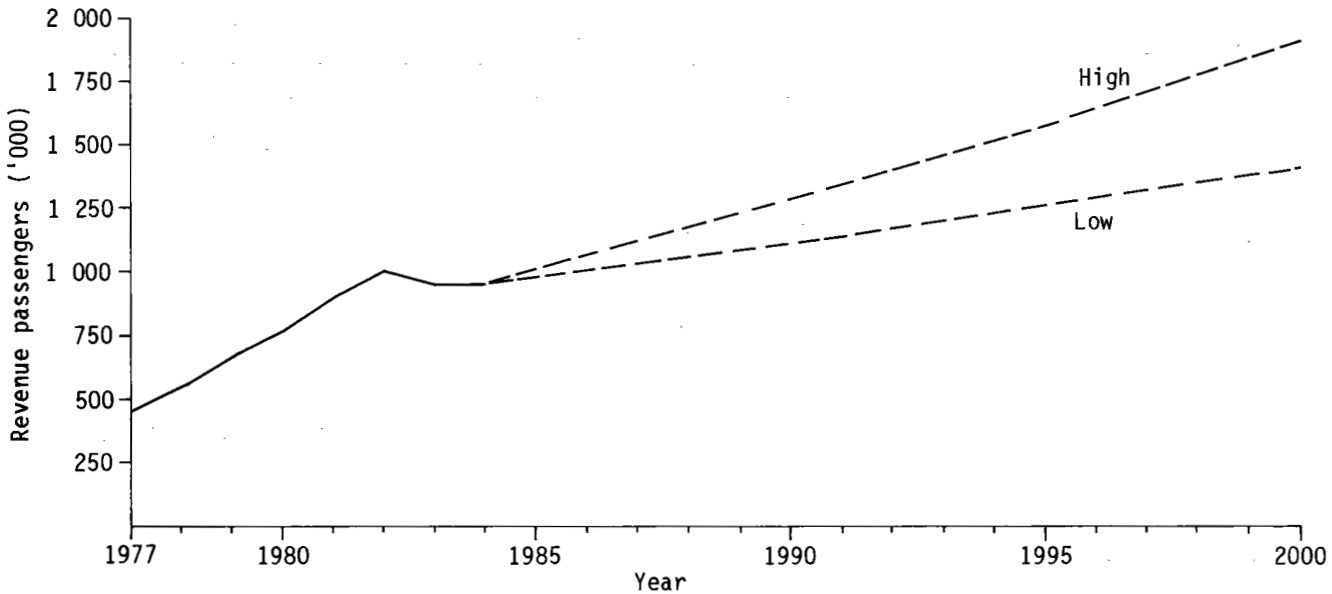
Figure 5.1 Trunk airline revenue passengers, historical trend and forecasts to 2000



Note Actual revenue passengers, 1977-84.

Sources DoT (1982b). DofA (1985a). BTE estimates.

Figure 5.2 Regional airline revenue passengers, historical trend and forecasts to 2000



Note Actual revenue passengers, 1977-84.

Sources DoT (1982c). DofA (1985b). BTE estimates.

Figure 5.3 Commuter airline revenue passengers, historical trend and forecasts to 2000

Trunk patronage

Growth rates for all five sub-markets identified in the preceding chapter are expected to moderate throughout the forecast period. In general, growth rates for the medium-haul, long-haul and 'winter sunspots' sub-markets exceed the weighted average growth rate for the total sample of routes. Total trunk airline patronage is expected to increase from just over 9.0 million revenue passengers in 1984 to between 12.7 and 16.0 million revenue passengers in the year 2000 under the low and high growth scenarios respectively (see Table VII.2 of Appendix VII).

On an individual route basis, strong growth is expected throughout

TABLE 5.3 FORECAST AVERAGE ANNUAL GROWTH RATES FOR REGIONAL AIRLINE PASSENGERS, 1985 TO 2000

(per cent per annum)

		Year			
State	*Scenario*	*1985*	*1986-90*	*1991-95*	*1996-2000*
New South Wales					
Intrastate	High	3.7	2.3	2.0	1.6
	Low	2.0	0.9	0.6	0.3
Interstate[a]		4.1	3.6	3.1	2.7
Queensland[b]	High	0.7	0.3	0.0	0.0
	Low	-0.8	-1.3	-1.3	-1.3
Western Australia	High	7.2	6.3	6.0	5.0
	Low	5.6	4.9	4.4	3.6
South Australia	High	7.9	4.6	3.8	3.0
	Low	5.6	2.5	1.8	1.0
Northern Territory[a]		4.4	3.9	3.3	2.8
Australia[c]	High	4.8	3.7	3.4	3.0
	Low	3.5	2.6	2.3	1.9

a. Results based on a simple linear regression. Includes Sydney-Coolangatta patronage.
b. Growth rate based on one stable route only.
c. There are no regional airlines based in Victoria or Tasmania. Weighted average on the basis of forecast patronage.

Source BTE estimates.

the forecast period for the Sydney-Darwin/Coolangatta/Townsville and Adelaide-Darwin routes. Patronage on the Sydney-Canberra route is expected to remain relatively constant and perhaps even decline in the late 1990s. Forecasts for individual trunk routes are presented in Table VII.1 of Appendix VII.

Regional patronage

Moderate growth is expected throughout the forecast period in all

TABLE 5.4 FORECAST AVERAGE ANNUAL GROWTH RATES FOR COMMUTER AIRLINE PASSENGERS, 1985 TO 2000

(per cent per annum)

State	*Scenario*	*Year*			
		1985	*1986-90*	*1991-95*	*1996-2000*
New South Wales	High	3.6	4.5	3.5	3.5
	Low	0.2	0.7	0.6	0.6
Victoria	High	4.8	4.8	4.7	4.2
	Low	4.2	3.9	3.8	3.3
Queensland	High	3.4	1.9	1.5	1.1
	Low	2.4	1.1	0.7	0.3
Western Australia	High	5.2	2.8	2.6	2.5
	Low	1.1	-0.4	-0.6	-0.7
South Australia	High	12.7	9.9	9.1	7.5
	Low	10.7	7.8	7.1	5.4
Tasmania	High	8.6	4.8	4.0	3.3
	Low	5.6	2.0	1.3	1.3
Northern Territory[a]		13.1	9.6	6.4	4.9
Australia[b]	High	5.4	4.8	4.3	4.0
	Low	3.2	2.5	2.5	2.2

a. Based on a simple linear regression.
b. Weighted average on the basis of forecast patronage.

Source BTE estimates.

States with the exception of Queensland. However, as these results are based on only one route the results cannot be considered conclusive. Regional traffic in Western Australia is expected to grow strongly under both scenarios. Total regional airline patronage is expected to increase from just under 1.9 million passengers in 1984 to between 2.7 and 3.2 million passengers in the year 2000 (see Table VII.3).

Commuter patronage

With the exception of Western Australia, where patronage is expected to remain relatively constant under the low growth scenario, commuter patronage is expected to grow in all States throughout the forecast period under both scenarios. Continued strong growth is expected in South Australia to the end of the century. Total commuter patronage is expected to grow from just over 950 000 in 1984 to between 1.4 million and 1.9 million passengers in the year 2000 (see Table VII.4).

Domestic air freight

Table 5.5 contains the forecast average annual growth rates for trunk, regional and commuter freight. Figures 5.4 to 5.6 show the corresponding tonnages for the three markets.

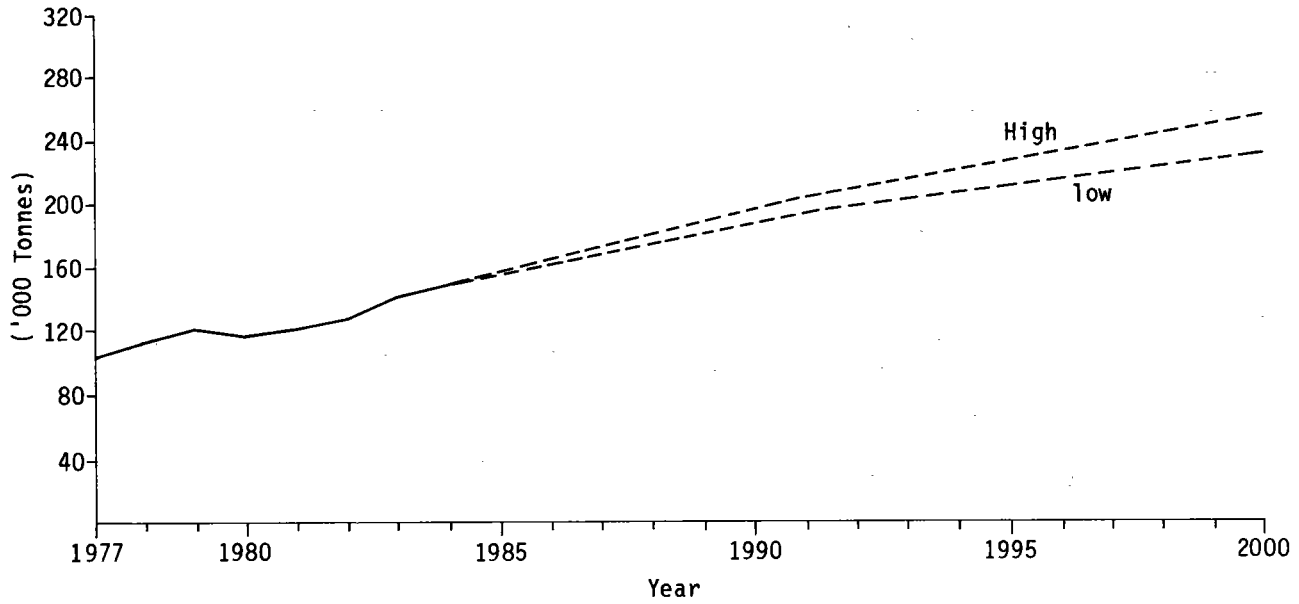
TABLE 5.5 FORECAST AVERAGE ANNUAL GROWTH RATES FOR DOMESTIC AIR FREIGHT[a], 1985 TO 2000

(per cent per annum)

Market sector	*Scenario*	*Year*			
		1985	*1986-90*	*1991-95*	*1996-2000*
Trunk[b]	High	6.0	4.0	3.3	2.6
	Low	5.2	3.2	2.6	1.9
Regional	High	0.8	0.4	0.2	0.2
	Low	0.0	0.0	-0.1	-0.1
Commuter	High	6.2	4.1	3.4	2.7
	Low	5.4	3.3	2.7	2.0

a. Excluding mail.
b. Includes IPEC Aviation.

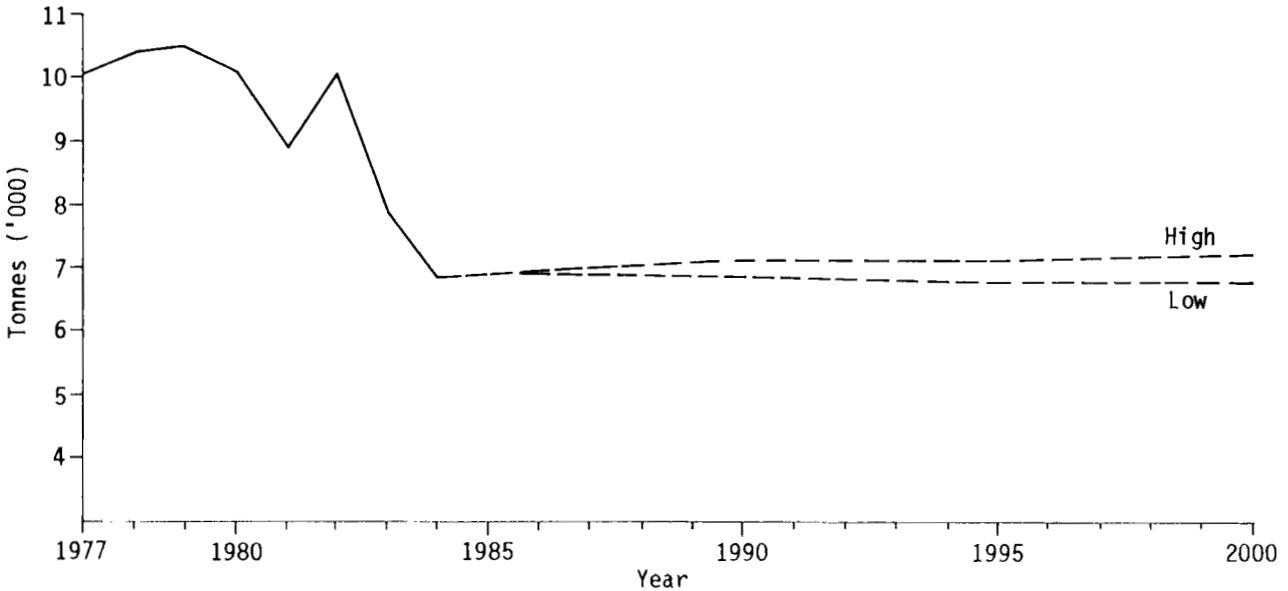
Source BTE estimates.



Notes 1. Actual freight tonnage, 1977-84.
2. Includes IPEC Aviation.

Sources DoT (1982b). DofA (1985a). BTE estimates.

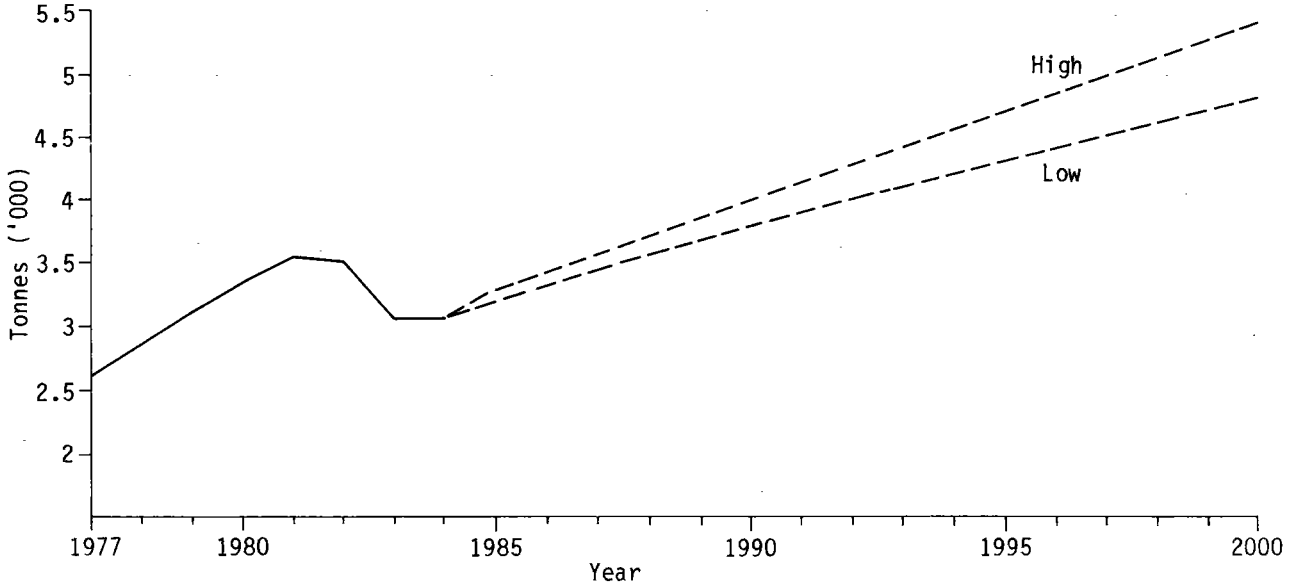
Figure 5.4 Freight carried by trunk airlines, historical trend and forecasts to 2000



Notes 1. Actual freight tonnage, 1977-84.
2. Excludes IPEC Aviation.

Sources DoT (1982b). DofA (1985a). BTE estimates.

Figure 5.5 Freight carried by regional airlines, historical trend and forecasts to 2000



Note Actual freight tonnage, 1977-84.

Sources DoT (1982c). DofA (1985b). BTE estimates.

Figure 5.6 Freight carried by commuter airlines, historical trend and forecasts to 2000

The volume of freight carried by both trunk (including IPEC Aviation) and commuter airlines is expected to grow moderately throughout the forecast period; however, freight carried by regional airlines, is likely to remain close to present levels. Under the high growth scenario the volume of freight carried by trunk, regional and commuter airlines is forecast to be 249 100, 7200 and 5400 tonnes respectively (see Table VII.5).

CHAPTER 6 CONCLUDING REMARKS

Following substantial growth in the 1970s, the number of trunk airline passengers declined in the early 1980s; long-term growth under current regulatory arrangements is expected to be between 2.2 and 3.6 per cent per annum. Total regional patronage has fluctuated around a general upward trend over the study period and total patronage is expected to grow at between 2.4 and 3.5 per cent per annum to the end of the century. Commuter patronage has been characterised by rapid growth throughout the 1970s and early 1980s with the exception of 1983-84. However, route change-overs from commuter to regional airline status by AIRQ (since 1982) and the introduction of the 'two pilot' rule in 1983 were probably significant factors contributing to this observation. Long-term growth in commuter patronage is expected to be between 2.4 and 4.4 per cent per annum.

The volume of freight carried by both trunk (including IPEC Aviation) and commuter airlines is expected to grow moderately throughout the forecast period; however, freight carried by regional airlines is likely to remain close to present levels. These results should be regarded as indicative only as the deregulation of the domestic air freight industry in 1982 has resulted in the distinction between trunk and regional freight being less appropriate than is the case for passenger forecasts.

The forecasts developed in this Paper assume there is no transfer of routes between operator classes or changes to the current regulatory arrangements. The high and low forecasts relate to a 'favourable' and 'adverse' set of scenarios for those factors found to influence demand. The midpoint of the high and low forecasts should not be interpreted as a 'best' estimate. The scenarios used to generate the forecasts reflect high and low growth rates for each explanatory variable which cannot be considered as identical high and low variations about a 'best' estimate. In addition, the forecasts derived from the elasticities do not take account of the statistical error limits which could be derived for the estimated regression models.

The results presented in this Paper are a further refinement of earlier BTE work in this area. It is unlikely that the use of origin-destination information would result in significantly different results, particularly at the aggregate level. However, for individual routes where direct services have been introduced, such as Sydney-Perth, the use of origin-destination data would overcome the estimation difficulties associated with the use of uplift-discharge data. The demand analysis and associated forecasts could be further improved by explicitly allowing for differences in purpose of travel and the range of fare types available, if the necessary information can be obtained.

APPENDIX I SAMPLE TRUNK ROUTES

For the purposes of this Paper the trunk routes were divided into five sub-markets based on route characteristics and travel patterns: three sub-markets according to route length and two based on holiday travel patterns (summer and winter). Quarterly uplift-discharge data were collected to the end of the most recently available period, that is, to the end of calendar year 1984. The study period chosen was for the eight calendar years 1977 to 1984.

Uplift-discharge data for a total of 30 trunk routes (representing 94 per cent of trunk airline travel in 1984) are contained in Table I.1. Of the 30 routes sampled, six routes had a decline in patronage over the period. The more signficant declines were for the Sydney-Canberra, Adelaide-Perth and Melbourne-Launceston/Hobart routes. Some of the decline on these routes may be attributable to the recession and real fare increases on the shorter routes.[1] However, the decline on the Tasmanian and Adelaide routes also reflects the change in service patterns of the major airlines towards the use of more direct flights. This is most notable for the Adelaide-Perth route where patronage declined by 19 per cent while patronage on the direct Sydney-Perth route increased by about 381 per cent. The two routes, combined increase was just over 36 per cent between 1977 and 1984.

Similarly, while the Tasmanian routes ex-Melbourne declined in patronage, the effect of Sydney-Hobart/Launceston direct flights was to increase travel to and from Tasmania over the period.

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1. Following implementation of the Holcroft recommendations the flagfall component of the air fare formula increased by 83.5 per cent in April 1981. The associated effect on the short-haul fare index from March quarter 1981 to March quarter 1982 was 42.7 per cent increase in real terms (BTE 1985c).

TABLE I.1 TRUNK AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Routes	Distance (kilometres)	Revenue passengers 1977	Revenue passengers 1984[p]	Patronage change (per cent)	Average annual growth rate (per cent)	1984 patronage as proportion of total trunk airline passengers (per cent)
Short-haul (less than 800 km)						
Sydney-Canberra	237	593 183	514 294	-13.3	-2.0	5.7
Townsville-Cairns	283	68 331	86 384	26.4	3.4	1.0
Melbourne-Canberra	470	303 216	348 217	14.8	2.0	3.9
Brisbane-Rockhampton	520	128 783	143 526	11.4	1.6	1.6
Melbourne-Adelaide	643	666 436	663 695	-0.4	0.0	7.3
Sydney-Melbourne	707	1 800 938	1 970 772	9.4	1.3	21.8
Sydney-Brisbane	747	1 068 812	1 205 130	12.8	1.7	13.3
Group		4 629 699	4 932 018	6.5	0.9	54.5
Medium-haul (800-1700 km)						
Brisbane-Canberra[a]	951	..	4 509	..	..	0.0
Adelaide-Canberra	972	6 233	14 959	140.0	13.3	0.2
Brisbane-Townsville	1 114	193 188	225 012	16.5	2.2	2.5
Sydney-Adelaide	1 166	404 692	424 127	4.8	0.7	4.7
Adelaide-Alice Springs	1 316	82 211	109 197	32.8	4.1	1.2

TABLE I.1 (Cont.) TRUNK AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Routes	*Distance (kilometres)*	*Revenue passengers*		*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total trunk airline passengers (per cent)*
		1977	*1984*[p]			
Melbourne-Brisbane	1 376	228 009	350 178	53.6	6.3	3.9
Brisbane-Cairns	1 392	151 331	215 897	42.7	5.2	2.4
Brisbane-Mount Isa	1 572	40 641	40 359	-0.7	0.0	0.4
Group		1 106 305	1 384 238	25.1	3.3	15.3
Long-haul (over 1700 km)						
Adelaide-Perth	2 120	237 236	191 537	-19.3	-3.0	2.1
Adelaide-Darwin	2 619	36 763	74 052	101.4	10.5	0.8
Melbourne-Perth	2 707	200 066	301 730	50.8	6.0	3.3
Sydney-Darwin	3 154	6 408	16 280	154.1	14.2	0.2
Sydney-Perth	3 284	38 120	183 223	380.6	25.1	2.0
Brisbane-Perth[b]	3 611	..	5 851	..	..	0.1
Group		518 593	772 673	49.0	5.9	8.5

TABLE I.1 (Cont.) TRUNK AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Routes	*Distance (kilometres)*	*Revenue passengers* 1977	*Revenue passengers* 1984[p]	*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total trunk airline passengers (per cent)*
'Summer holiday' (Tasmania)						
Melbourne-Devonport	412	81 828	87 960	7.5	1.0	1.0
Melbourne-Launceston	476	320 621	308 175	-3.9	-0.6	3.4
Melbourne-Hobart	617	406 523	366 801	-9.8	-1.5	4.1
Sydney-Launceston[c]	915	..	40 853	..	..	0.5
Sydney-Hobart[c]	1 040	..	70 063	..	..	0.8
Group		808 972	873 852	8.0	1.1	9.7
'Winter sunspots' (Queensland)						
Sydney-Coolangatta	679	223 087	347 071	55.6	6.5	3.8
Melbourne-Coolangatta[d]	1 330	..	158 914	..	..	1.8
Sydney-Townsville[c]	1 689	..	25 463	..	..	0.3
Sydney-Cairns[a]	1 970	..	34 593	..	..	0.4
Group		223 087	566 041	153.7	14.2	6.3

TABLE I.1 (Cont.) TRUNK AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Routes	*Distance (kilometres)*	*Revenue passengers* 1977	1984[p]	*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total trunk airline passengers (per cent)*
Total sample routes		7 286 656	8 528 822	17.0	2.3	94.3
Total trunk patronage		8 334 864	9 044 500	8.5	1.2	100.0

a. Data from 1979 to 1984.
b. Data from December quarter 1982.
c. Data from 1978 to 1984.
d. Data from 1980 to 1984.

p Preliminary.

.. Not applicable.

Sources DoT (1982a, 1982b). DofA (1985a). DofA (personal communication).

APPENDIX II SAMPLE REGIONAL ROUTES

A sample of 32 regional routes operated by the five larger regional airlines formed the basis of the statistical analysis. The sample adequately represents the differing network characteristics of density and distance for the regional operators at the intrastate level. The sample uplift-discharge data for these airlines covered 1.07 million passengers or 58 per cent of total regional passenger travel in 1984. Individual airline figures were:

- ASA (five routes sampled equivalent to 99 per cent of total airline patronage)
- ANSW (nine routes sampled equivalent to 81 per cent of total airline patronage)
- AWA (eight routes sampled equivalent to 65 per cent of total airline patronage)
- EWA (nine routes sampled equivalent to 44 per cent of total airline patronage)
- AIRQ (one route, included for completeness, equivalent to 11 per cent of total airline patronage.

Table II.1 summarises the growth in patronage between 1977 and 1984 for the sample of regional airline routes.

New South Wales

At the Australia-wide network level both EWA and ANSW patronage grew strongly over the study period. This reflected the introduction of new routes, particularly interstate services. However, to maintain continuity in the samples and for comparative purposes, these new services were not included in the empirical analyses. From the sample of EWA routes moderate growth was achieved on the Sydney-Kempsey and Sydney-Grafton routes while patronage on the Sydney-Albury route remained static. Patronage on all other EWA routes declined. The more significant declines were for the Sydney-Inverell and Sydney-Glen Innes routes. Patronage on the sampled ANSW routes with the exception of the Sydney-Moree/Casino/Broken Hill/Coffs Harbour routes also

TABLE II.1 REGIONAL AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Revenue passengers*		*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total regional airline passengers (per cent)*
			1977	*1984[p]*			
East-West Airlines							
Sydney to:							
Taree	260	F27	24 106	21 201	-12.1	-1.8	1.1
Tamworth	319	F28	81 689	73 578	-9.9	-1.5	4.0
Port Macquarie	320	F27	39 789	36 925	-7.2	-1.1	2 0
Kempsey	352	F27	11 675	12 273	5.1	0.7	0.7
Armidale	381	F27	56 732	52 144	-8.1	-1.2	2.8
Inverell	450	F27	14 865	11 536	-22.4	-3.6	0.6
Albury	452	F28	57 060	57 125	0.1	0.0	3.1
Glen Innes	476	F27	7 434	4 934	-33.6	-5.7	0.3
Grafton	497	F27	25 014	26 193	4.7	0.7	1.4
7 F27 routes	376	F27	179 615	165 206	-8.0	-1.2	8.9
9 Intrastate routes	377	F27	318 364	295 909[a]	-7.1	-1.0	15.9
Total EWA	572	..	458 884	668 900	45.8	5.5	36.0

TABLE II.1 (Cont.) REGIONAL AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Revenue passengers*		*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total regional airline passengers (per cent)*
			1977	*1984*[p]			
Airlines of NSW							
Sydney to:							
Dubbo	309	F28	72 615	59 785	-17.7	-2.7	3.2
Cooma	330	F28	33 834	23 151	-31.6	-5.3	1.2
Merimbula	350	F27	15 128	13 585	-10.2	-1.5	0.7
Wagga Wagga	367	F27	68 556	60 320	-12.0	-1.8	3.2
Coffs Harbour	442	F27	46 716	62 126	33.0	4.2	3.3
Griffith	472	F27	26 425	23 057	-12.7	-1.9	1.2
Moree	509	F27	16 006	18 156	13.4	1.8	1.0
Casino	590	F27	43 886	51 230	16.7	2.2	2.8
Broken Hill	932	F28	11 305	11 775	4.2	0.6	0.6
6 F27 routes	462	F27	216 717	228 474	5.4	0.8	12.3
9 Intrastate routes	441	F27	334 471	323 185[b]	-3.4	-0.5	17.4
Total ANSW patronage	497	..	374 798	400 800	6.9	1.0	21.6

TABLE II.1 (Cont.) REGIONAL AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Revenue passengers* 1977	*Revenue passengers* 1984[p]	*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total regional airline passengers (per cent)*
Airlines of SA							
Adelaide to:							
Kingscote	125	F27	56 182	40 725	-27.5	-4.5	2.2
Whyalla	230	F27	38 984	42 667	9.4	1.3	2.3
Port Lincoln	246	F27	63 161	66 258	4.9	0.7	3.6
Mount Gambier	371	F27	21 777	20 782	-4.6	-0.7	1.1
Broken Hill	426	F27	16 976	17 178	1.2	0.2	0.9
5 Intrastate routes	246	F27	197 080	187 610[c]	-4.8	-0.7	10.1
Total ASA patronage	251	..	218 854	190 100	-13.1	-2.0	10.2
Ansett WA							
Perth to:							
Geraldton	370	F28	26 724	23 248	-13.0	-2.0	1.3
Kalgoorlie	538	F28	28 872	59 974	107.7	11.0	3.2
Learmonth	1 094	F28	6 235	8 431	35.2	4.4	0.5
Karratha	1 250	F28	39 688	94 364	137.8	13.2	5.1
Port Hedland	1 312	F28	31 691	40 858	28.9	3.7	2.2
Derby	1 795	F28	9 410	17 796	89.1	9.5	1.0

TABLE II.1 (Cont.) REGIONAL AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Revenue passengers*		*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total regional airline passengers (per cent)*
			1977	*1984[p]*			
Darwin to:							
Port Hedland	1 578	F28	776	1 087	40.1	4.9	0.1
Perth	2 651	F28	7 669	15 856	106.8	10.9	0.9
6 Intrastate routes	1 037	F28	142 620	244 671	71.6	8.0	13.2
8 Sample routes	1 136	F28	151 065	261 614[d]	73.2	8.2	14.1
Total AWA patronage	1 141	..	306 390	400 100	30.6	3.9	21.5
Air Queensland							
Brisbane to:							
Emerald	653	F27	..	11 369[e]	..	..	0.6
Total AIRQ regional patronage	551	..	..	107 400	..	..	5.8

TABLE II.1 (Cont.) REGIONAL AIRLINE PATRONAGE, SAMPLE ROUTES, 1977 AND 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Revenue passengers*		*Patronage change (per cent)*	*Average annual growth rate (per cent)*	*1984 patronage as proportion of total regional airline passengers (per cent)*
			1977	*1984*[p]			
Grouped totals							
18 Intra-NSW routes	410	..	652 835	619 094	-5.2	-0.8	33.3
29 Intrastate routes	527	..	992 535	1 051 375	5.9	0.8	56.6
31 Total routes	559	..	1 000 980	1 068 318[f]	6.7	0.9	57.5
Total regional airlines	399	..	1 419 586	1 858 600	30.9	3.9	100.0

a. EWA sample 9 routes equals 44.2 per cent of EWA total revenue passengers in 1984.
b. ANSW sample 9 routes equals 80.6 per cent of ANSW total revenue passengers in 1984.
c. ASA sample 5 routes equals 98.7 per cent of ASA total revenue passengers in 1984.
d. AWA sample 8 routes equals 65.4 per cent of AWA total revenue passengers in 1984.
e. AIRQ sample route, included for completeness, equals 10.6 per cent of AIRQ total revenue passengers in 1984.
f. AIRQ not included as the Brisbane-Emerald service was not provided in 1977. Total sample of 32 routes equals 58.1 per cent of total regional airline patronage in 1984.

Note All distance figures reported for group totals are weighted averages on the basis of 1984 revenue passengers.

p Preliminary.

.. Not applicable.

Sources DOT (1982a, 1982b). DofA (1985a). DofA (personal communication).

TABLE II.2 NEW SOUTH WALES REGIONAL SUB-MARKETS

Group	*Route*
Routes to major regional centres	Sydney-Albury
	Sydney-Dubbo
	Sydney-Tamworth
	Sydney-Wagga Wagga
Routes to minor regional centres	Sydney-Armidale
	Sydney-Broken Hill
	Sydney-Cooma
	Sydney-Glen Innes
	Sydney-Griffith
	Sydney-Inverell
	Sydney-Merimbula
	Sydney-Moree
Routes to the Central Coast area	Sydney-Kempsey
	Sydney-Port Macquarie
	Sydney-Taree
Routes to the North Coast area	Sydney-Casino
	Sydney-Coffs Harbour
	Sydney-Grafton

Note Derived from sample of New South Wales regional routes used in the empirical analysis.

declined over the period. The most notable declines were for the Sydney-Cooma and Sydney-Dubbo routes. Table II.2 contains the routes in each sub-market according to population and geographic characteristics used in the empirical work.

South Australia

In South Australia, two of the routes in the ASA sample declined over the period, indicating the increased market share achieved by commuter operators. Appendix III contains details of the competitive South Australian routes.

Western Australia

Patronage on all sampled AWA routes with the exception of Perth-Geraldton increased over the study period. Extremely strong

growth occurred on the Perth-Kalgoorlie/Karratha routes. Strong growth was also achieved on the Perth-Darwin route; however, the base year (that is, 1977) patronage was relatively small.

Queensland

In order to maintain data continuity it was appropriate to include one route, Brisbane-Emerald, in the empirical analysis. Although this route was formerly operated as a commuter service by AIRQ it now forms part of that airline's regional operations. Since changing name from Bush Pilots Airlines to AIRQ in November 1980, AIRQ has operated both as an airline and under a supplementary airline licence. However, the airline has undertaken a gradual changeover of commuter routes to airline status with the introduction of further F27 services since January 1982. As at June 1984 AIRQ regional airline operations represented 36.6 per cent of its total passenger operations.

APPENDIX III SAMPLE COMMUTER ROUTES

Commuter operator data for individual routes were generally only readily available to 1983. A total of 32 routes, selected on the basis of data availability, was used in the empirical analysis. Table III.1 provides details of the sample routes and patronage for the years 1979-80 and 1983-84.

New South Wales

Patronage on all routes in New South Wales with the exception of the Sydney-Belmont route declined over the period. The total decrease for the sample of 12 routes was 10.5 per cent.

South Australia

The commuter sector in South Australia grew strongly over the period from 47 507 revenue passengers in 1979-80 to 71 971 revenue passengers in 1983-84. These figures indicate the significant inroads that commuter operators have made on the competitive routes from Adelaide to Kingscote, Mount Gambier, Port Lincoln and Whyalla.[1] Table III.2 details patronage on these four routes and the respective commuter and regional market shares. This table shows that commuter patronage has grown strongly on all four competitive routes with significant gains being achieved on the Kingscote and Port Lincoln routes in 1980-81. Patronage declined on the other four routes in the sample.

Western Australia

A sample of four Western Australian routes operated by Skywest Airlines was used in the empirical analysis. Total patronage for the sampled routes increased from 21 876 to 31 800 revenue passengers in 1983-84, representing an increase of 45.4 per cent.

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1. During 1979, exemptions under ANR203 were granted by the Department of Transport enabling commuter operators to provide services on these four routes subject to fare and schedule approval.

TABLE III.1 COMMUTER AIRLINE PATRONAGE, SAMPLE ROUTES, 1979-80 AND 1983-84

Airline	*Route*	*Distance (kilometres)*	*Revenue passengers* 1979-80	1983-84	*Change (per cent)*
New South Wales					
Aeropelican Air Services	Sydney-Newcastle (Belmont)	141	96 288	102 139	6.1
East Coast Airlines[a]	Sydney-Newcastle (Williamtown)	110	45 051	43 586	-3.3
	Sydney-Young	272	5 914	3 193	-46.0
	Sydney-Cootamundra	299	5 557	3 414	-38.6
	Sydney-Temora	342	2 672	546	-79.6
	Canberra-Newcastle (Williamtown)	371	6 607	3 897	-41.0
Hazelton Air Services	Sydney-Moruya	237	4 887	3 704	-24.2
	Sydney-Gunnedah	343	6 913	5 350	-22.6
MacKnight Airlines	Deniliquin-Wagga Wagga	233	4 940	3 745	-24.2
Singleton Air Services	Sydney-Cessnock	130	11 228	3 384	-69.9
	Sydney-Scone	214	6 630	4 107	-38.1
Western NSW Airlines	Canberra-Wagga Wagga	158	3 020	1 578	-47.7
Total (sample of 12 routes)			199 707	178 643	-10.5

TABLE III.1 (Cont.) COMMUTER AIRLINE PATRONAGE, SAMPLE ROUTES, 1979-80 AND 1983-84

Airline	*Route*	*Distance (kilometres)*	*Revenue passengers* 1979-80	1983-84	*Change (per cent)*
South Australia					
Air Transit	Adelaide-American River	116	4 510	4 241	-6.0
	Adelaide-Kingscote	125	..	3 253	..
	Adelaide-Parndana	148	5 421	4 955	-8.6
Albatross Airlines	Adelaide-Kingscote	125	4 120	7 387	79.3
Commodore Air	Adelaide-Penneshaw	101	5 133	2 465	-52.0
	Adelaide-Kingscote	125	..	12 699	..
	Adelaide-Whyalla	230	..	8 271	..
	Adelaide-Port Lincoln	246	9 664	17 047	76.4
	Adelaide-Broken Hill	426	2 473	1 320	-46.6
Murray Valley Airlines	Adelaide-Mount Gambier	371	..	2 277	..
O'Connor Airlines	Adelaide-Mount Gambier	371	..	2 433	..
Rossair	Adelaide-Kingscote	125	..	836	..
	Adelaide-Whyalla	230	..	1 472	..
	Adelaide-Port Lincoln	246	..	1 811	..
	Adelaide-Mount Gambier	371	4 032	1 504	-62.7
Total (sample of 8 routes, all operators)			47 507	71 971	51.5

TABLE III.1 (Cont.) COMMUTER AIRLINE PATRONAGE, SAMPLE ROUTES, 1979-80 AND 1983-84

Airline	*Route*	*Distance (kilometres)*	*Revenue passengers* 1979-80	1983-84	*Change (per cent)*
Western Australia					
Skywest Airlines	Perth-Bunbury	165	2 373	7 011	195.4
	Perth-Albany	375	8 918	9 439	5.8
	Perth-Esperance	582	9 274	13 779	48.6
	Perth-Meekatharra	643	1 311	1 571	19.8
Total (sample of 4 routes)			21 876	31 800	45.4
Queensland					
Air Queensland	Cairns-Cooktown	171	5 250	4 485	-14.6
	Cairns-Karumba	528	4 636	3 612	-22.1
Coddair Airlines[b]	Brisbane-Toowoomba	117	12 459	5 027	-19.2[c]
Sunstate Airlines	Brisbane-Toowoomba	117	..	5 037	..
Total (sample of 3 routes)			22 345	18 161	-18.7
Victoria					
Kendell Airlines	Melbourne-Wagga Wagga	365	13 777	11 302	-18.0
Murray Valley Airlines	Melbourne-Swan Hill[d]	281	..	..	..
Sovereign Airlines[e]	Melbourne-Bendigo	114	2 695	..	..
	Melbourne-Swan Hill	281	2 961	..	..
Total (sample of 3 routes)			19 433	..	..

TABLE III.1 (Cont.) COMMUTER AIRLINE PATRONAGE, SAMPLE ROUTES, 1979-80 AND 1983-84

Airline	*Route*	*Distance (kilometres)*	*Revenue passengers* 1979-80	1983-84	*Change (per cent)*
Tasmania					
Airlines of Tasmania	Hobart-Launceston	147	3 804	980	-74.2
	Hobart-Wynyard	253	4 376	3 289	-24.8
Total (sample of 2 routes)			8 180	4 269	-47.8

a. East Coast Airlines became known as Eastern Airlines in September 1985.
b. Coddair Airlines ceased operations in June 1985 as a result of the Norfolk Island Airlines takeover. The reported passenger figures are for Air Queensland which formerly operated this service.
c. Based on total 1984 route passenger figure of 10 064 revenue passengers.
d. Commenced January 1983, ceased June 1983.
e. Ceased operations December 1982.

.. Not applicable.

Notes 1. Individual operator uplift-discharge data was aggregated for the empirical analysis.
2. South Australian total for 1979-80 includes all operators providing services in that year.

Sources DoT (1982a, 1982c). DofA (1985b, personal communication).

TABLE III.2 PATRONAGE FOR COMPETITIVE SOUTH AUSTRALIAN ROUTES, 1979-80 TO 1983-84

	Commuter operations			*ASA operations*				
Year	*Commuter patronage*	*Proportion of total patronage (per cent)*	*Annual change (per cent)*	*ASA patronage*	*Proportion of total patronage (per cent)*	*Annual change (per cent)*	*Total patronage*	*Annual change (per cent)*
Adelaide-Kingscote								
1979-80	9 760	13.4	..	62 906	86.6	..	72 666	..
1980-81	16 787	24.2	72.0	52 642	75.8	-16.3	69 429	-4.5
1981-82	19 491	27.7	16.1	50 778	72.3	-3.5	70 269	1.2
1982-83	23 294	32.4	19.5	48 517	67.6	-4.5	71 811	2.2
1983-84	24 086	36.1	3.4	42 687	63.9	-12.0	66 773	-7.0
Adelaide-Mount Gambier								
1979-80	4 032	14.0	..	24 686	86.0	..	28 718	..
1980-81	3 278	11.6	-18.7	24 877	88.4	0.8	28 155	-2.0
1981-82	4 299	15.5	31.1	23 382	84.5	-6.0	27 681	-1.7
1982-83	4 187	16.4	-2.6	21 298	83.6	-8.9	25 485	-7.9
1983-84	6 214	23.4	48.4	20 300	76.6	-4.7	26 514	4.0

TABLE III.2 (Cont.) PATRONAGE FOR COMPETITIVE SOUTH AUSTRALIAN ROUTES, 1979-80 TO 1983-84

	Commuter operations			*ASA operations*				
Year	*Commuter patronage*	*Proportion of total patronage (per cent)*	*Annual change (per cent)*	*ASA patronage*	*Proportion of total patronage (per cent)*	*Annual change (per cent)*	*Total patronage*	*Annual change (per cent)*
Adelaide-Port Lincoln								
1979-80	9 664	13.1	..	63 937	86.9	..	73 601	..
1980-81	17 389	23.1	79.9	58 004	76.9	-9.3	75 393	2.4
1981-82	18 877	24.3	8.6	58 653	75.7	1.1	77 530	2.8
1982-83	18 606	25.5	-1.4	54 297	74.5	-7.4	72 903	-6.0
1983-84	18 858	23.0	1.4	63 037	77.0	16.1	81 895	12.3
Adelaide-Whyalla								
1979-80	2 394	5.1	..	44 514	94.9	..	46 908	..
1980-81	1 831	3.8	-23.5	46 356	96.2	4.1	48 187	2.7
1981-82	7 674	15.5	319.1	41 677	84.5	-10.1	49 351	2.4
1982-83	10 257	19.9	33.7	41 368	80.1	-0.7	51 625	4.6
1983-84	9 743	17.7	-5.0	45 256	82.3	9.4	54 999	6.5

.. Not applicable.

Source DofA (1985b, personal communication).

Queensland

Patronage on each of the three Queensland routes declined over the period, with total patronage for the three routes declining by 18.7 per cent.

Victoria

Three Victorian commuter routes were used in the empirical work. The commuter services from Melbourne to Bendigo and Swan Hill ceased in December 1982 and June 1983 respectively, hence the empirical work was based on quarterly data for the period March 1977 to December 1982.

Tasmania

Two routes operated by Airlines of Tasmania were used in the empirical analysis. Total patronage for the sampled routes declined from 8180 in 1979-80 to 4269 in 1983-84, representing a decline of 47.8 per cent.

APPENDIX IV TRUNK AIRLINE FARES

TRUNK AIRLINE FARES

Table IV.1 contains indices of current and real economy air fares, between the September quarter 1974 and the December quarter 1984, according to average fare increases. The average fare increases were calculated on the basis of the average increase in revenue expected as a result of a formula change. As a result the series is not comparable with data in Table IV.3 which reveals a weighted average increase for the sample of 30 trunk routes of 49.2 per cent for the period March quarter 1977 to December quarter 1984. In contrast, the change according to average fare increases resulting from formula adjustments was 38.4 per cent over the corresponding period.

TABLE IV.1 JET ECONOMY AIR FARE FORMULA, AVERAGE AIR FARE INCREASE, SEPTEMBER QUARTER 1974 TO DECEMBER QUARTER 1984

	Nominal		*Real*	
	Index	*Per cent change*	*Index*	*Per cent change*
1974 September	106.7	6.7	101.5	1.5
December	112.3	5.2	103.0	1.5
1975 March	111.9	-0.4	99.2	-3.7
June	111.9	0.0	95.7	-3.5
September	125.9	12.5	106.9	11.7
December	139.6	10.9	112.4	5.1
1976 March	139.6	0.0	109.1	-2.9
June	142.9	2.4	109.0	-0.1
September	148.1	3.6	110.3	1.2
December	148.1	0.0	104.2	-5.5
1977 March	148.1	0.0	101.8	-2.3
June	148.1	0.0	99.5	-2.3
September	154.6	4.4	101.9	2.4
December	159.4	3.1	102.6	0.7
1978 March	159.4	0.0	101.2	-1.4
June	159.4	0.0	99.3	-1.9
September	167.6	5.1	102.4	3.1
December	177.4	5.8	106.0	3.5
1979 March	177.4	0.0	104.2	-1.7
June	180.6	1.8	103.4	-0.8
September	195.2	8.1	109.1	5.5
December	195.2	0.0	106.0	-2.8
1980 March	205.4	5.2	109.1	2.9
June	213.4	3.9	110.3	1.1
September	224.9	5.4	114.1	3.4
December	232.4	3.3	115.5	1.2
1981 March	232.4	0.0	112.9	-2.3
June	249.6	7.4	118.5	5.0
September	260.4	4.3	121.2	2.3
December	269.5	3.5	120.4	-0.7

TABLE IV.1 (Cont.) JET ECONOMY AIR FARE FORMULA, AVERAGE AIR FARE INCREASE, SEPTEMBER QUARTER 1974 TO DECEMBER QUARTER 1984

	Current		*Real*	
	Index	*Per cent change*	*Index*	*Per cent change*
1982 March	287.3	6.6	126.2	4.8
June	287.3	0.0	123.2	-2.4
September	301.4	4.9	124.9	1.4
December	325.8	8.1	131.2	5.0
1983 March	342.6	5.2	135.0	2.9
June	343.8	0.4	132.6	-1.8
September	348.2	1.3	132.0	-0.5
December	368.4	5.8	136.5	3.4
1984 March	369.1	0.2	137.3	0.6
June	376.3	2.0	139.7	1.7
September	380.4	1.1	139.4	-0.2
December	389.7	2.4	140.9	1.1

Note 1 July 1974 = 100.0.

Source Derived from IAFC (personal communication).

TABLE IV.2 INDICES OF THE FLAGFALL AND DISTANCE COMPONENTS OF ECONOMY AIR FARE FORMULA, 1974-84

Date of approval	Flagfall		Distance			Economy fare	
	Index[a]	Per cent change	Index[a]	Index[a]	Per cent change	Index[a] (1.7.74 = 100.0)	Per cent change
12.8.74	100.0	..	100.0	..	..	112.5	12.5
28.11.74	100.0	0.0	99.5	..	-0.5[b]	111.9	-0.5
26.7.75	133.3	33.3	113.3	..	13.9	129.9	16.0
19.9.75	143.3	7.5	121.8	..	7.5	139.6	7.5
20.4.76	147.7	3.1	125.5	..	3.0	143.8	3.0
1.7.76	152.2	3.0	129.2	..	2.9	148.1	3.0
1.7.77	175.0	15.0	132.0	..	2.2	154.0	4.0
20.9.77	181.2	3.5	136.6	..	3.5	159.4	3.5
14.7.78	216.7	19.6	141.0	..	3.2	169.0	6.0
30.9.78	228.3	5.4	148.0	..	5.0	177.4	5.0
14.6.79	283.3	24.1	158.1	..	6.8	195.2	10.0
31.1.80	330.0	16.5	167.3	142.2[c]	5.8	210.8	8.0
8.6.80	345.0	4.5	174.1	148.0	4.1	221.3	5.0
1.9.80	363.3	5.3	182.6	155.2	4.9	232.4	5.0
1.4.81	666.7	83.5[d]	158.5	134.7	-13.2	249.6	7.4
11.8.81	720.0	8.0	171.2	145.5	8.0	269.5	8.0
31.12.81[e]	768.3	6.7	182.5	155.1	6.6	287.3	6.6
22.7.82	806.7	5.0	191.6	162.9	5.0	301.7	5.0

TABLE IV.2 (Cont.) INDICES OF THE FLAGFALL AND DISTANCE COMPONENTS OF ECONOMY AIR FARE FORMULA, 1974-84

Date of approval	Flagfall		Distance component			Economy fare	
			B	C	D		
	Index[a]	Per cent change	Index[a]			Index[a] (1.7.74 = 100.0)	Per cent change
18.9.82[f]	671.7	-16.7	100.0	100.0	100.0	325.8	8.0
6.1.83	681.7	1.5	110.1	143.2	391.4	343.8	5.5
1.7.83	690.0	1.2	111.6	145.0	397.1	348.2	1.3
3.10.83	725.0	5.1	119.4	161.9	480.0	369.1	6.0
2.4.84	740.0	2.1	121.7	165.1	488.6	376.5	2.0
3.9.84	766.7	3.6	126.5	178.8	574.3	389.7	3.5

a. Indices are in current terms.
b. A reduction occurred following discussions between the then Minister for Transport and the airlines concerning the payment of pilots at rates above those determined by arbitration. On 28 November 1974 following a determination by the Flight Crew Officers Tribunal the Minister directed the airlines to set fares at 0.5 per cent below the level approved in August.
c. Two-tier distance rate introduced, 85 per cent of first distance rate after 2 200km on Perth-Melbourne, Sydney and Darwin-Adelaide, Brisbane routes.
d. Formula changed significantly after consideration of Holcroft recommendations: flagfall component increased and distance component decreased.
e. Commencement of IAFC determinations of formula.
f. New air fare formula introduced followng IAFC Cost Allocation Review of August 1982. Form of equation adopted: Fare = $A+Bx+Cx^2+Dx^3$ where x is in units of 1000 km; A is flagfall component and B, C and D are distance components; that is, the coefficients of the linear, quadratic and cubic distance components respectively.

Note Distance indices were rebased to 100.0 on 18 September 1982 following introduction of new air fare formula.

.. Not applicable.

Sources Derived from BTE (1985d, 174) and IAFC (personal communication).

TABLE IV.3 TRUNK ROUTES, REAL FARE INCREASES, MARCH QUARTER 1977 TO DECEMBER QUARTER 1984

(per cent)

Route	*Real fare increase*
Short-haul routes (less than 800 km)	
Sydney-Canberra	88.0
Townsville-Cairns	85.9
Melbourne-Canberra	65.3
Brisbane-Rockhampton	62.0
Melbourne-Adelaide	55.5
Sydney-Melbourne	61.5
Sydney-Brisbane	50.8
Average (7 routes)	61.7
Medium-haul routes (800-1700km)	
Brisbane-Canberra	39.0
Adelaide-Canberra	38.2
Brisbane-Townsville	37.9
Sydney-Adelaide	36.4
Adelaide-Alice Springs	32.1
Melbourne-Brisbane	24.6
Brisbane-Cairns	31.1
Brisbane-Mt Isa	26.5
Average (8 routes)	32.2
Long-haul routes (over 1700km)	
Adelaide-Perth	16.0
Adelaide-Darwin	7.7
Melbourne-Perth	4.9
Sydney-Darwin	-0.1
Sydney-Perth	0.0
Brisbane-Perth	-11.1
Average (6 routes)	6.5
'Summer holiday' (Tasmania)	
Melbourne-Devonport	39.6
Melbourne-Launceston	62.4
Melbourne-Hobart	41.4
Sydney-Launceston	37.2
Sydney-Hobart	33.6
Average (5 routes)	47.9

TABLE IV.3 (Cont.) TRUNK ROUTES, REAL FARE INCREASES, MARCH QUARTER 1977 TO DECEMBER QUARTER 1984

(per cent)

Route	*Real fare increase*
'Winter sunspots' (Queensland)	
Sydney-Coolangatta	53.8
Melbourne-Coolangatta	27.3
Sydney-Townsville	13.4
Sydney-Cairns	10.3
Average (4 routes)	41.9
Average (30 routes)	49.2

Note Averages weighted by patronage.

Source BTE estimates.

APPENDIX V REGIONAL AIRLINE FARES

To construct comparable intrastate indices of real fare increases for regional airlines, a sample of major intrastate routes was chosen for each airline. Published standard or economy adult, one-way fares were weighted by quarterly uplift-discharge data to derive weighted average airline fares. Real air fare increases for the study period, March quarter 1977 to December quarter 1984, are given in Table V.1.

It was inappropriate to use regional airline fare indices based on airline fare determinations for the purposes of fare comparison in this Paper. This is because the published F27 or F28 'average' fare increase for each fare determination refers to that determination's effect on an airline's total Australia-wide network. Fares on several intrastate routes for the regional airline EWA are also based on either F27, F28 or F27/28 combined formula. Consequently, an average fare index based on the published average percentage increase for F27 or F28 formula determinations would not be fully representative of 'average fare' increases for each airline at the intrastate level.

TABLE V.1 REGIONAL AIRLINES, REAL FARE INCREASES FOR SAMPLE OF ROUTES, MARCH QUARTER 1977 TO DECEMBER QUARTER 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Real fare increase (per cent)*
East-West Airlines			
Sydney to:			
Taree	260	F27	33.26
Tamworth	319	F28	31.86
Port Macquarie	320	F27	33.91
Kempsey	352	F27	32.99
Armidale	381	F27	31.82
Inverell	450	F27	29.42
Albury	452	F28	30.45
Glen Innes	476	F27	27.60
Grafton	497	F27	34.01
7 F27 routes	376	F27	32.62
9 Intrastate routes	377	F27	32.04
Airlines of NSW			
Sydney to:			
Dubbo	309	F28	32.33
Cooma	330	F28	40.38
Merimbula	350	F27	36.22
Wagga	367	F27	29.83
Coffs Harbour	442	F27	31.09
Griffith	472	F27	26.43
Moree	509	F27	27.02
Casino	590	F27	25.51
Broken Hill	932	F28	20.65
6 F27 routes	462	F27	28.99
9 Intrastate routes	441	F27	29.73
Airlines of SA			
Adelaide to:			
Kingscote	125	F27	30.37
Whyalla	230	F27	28.03
Port Lincoln	246	F27	33.31
Mount Gambier	371	F27	29.25
Broken Hill	426	F27	30.80

TABLE V.1 (Cont.) REGIONAL AIRLINES, REAL FARE INCREASES FOR SAMPLE OF ROUTES, MARCH QUARTER 1977 TO DECEMBER QUARTER 1984

Airline and route	*Distance (kilometres)*	*Predominant aircraft type on route*	*Real fare increase (per cent)*
5 Intrastate routes	246	F27	30.81
Ansett WA			
Perth to:			
Geraldton	370	F28	35.43
Kalgoorlie	538	F28	18.61
Learmonth	1 094	F28	6.05
Karratha	1 250	F28	2.50
Port Hedland	1 312	F28	4.09
Derby	1 795	F28	-6.28
Darwin to:			
Port Hedland	1 578	F28	1.62
Perth	2 651	F28	-6.97
6 Intrastate routes	1 037	F28	9.71
2 Interstate routes	2 580	F28	-6.41
8 Total routes	1 136	F28	8.60
Grouped totals			
18 Intra-NSW routes	410	..	30.86
29 Intrastate routes	527	..	26.35
31 Total routes	559	..	25.85

.. Not applicable.

Note All distance figures reported for group totals are weighted averages on the basis of 1984 revenue passengers.

Source BTE estimates.

APPENDIX VI REGRESSION ANALYSIS

This appendix reports the results of the regression analyses for trunk, regional and commuter air services. Tables VI.1, VI.2, VI.3 and VI.4 contain details of the empirical analysis for individual trunk routes, trunk sub-markets, regional and commuter markets respectively. Table VI.5 provides details of the empirical analysis for domestic air freight carried by trunk, regional and commuter airlines. For completeness, simple linear regressions were used to estimate New South Wales interstate regional patronage (including Sydney-Coolangatta), ANA regional patronage and commuter patronage in the Northern Territory.

TABLE VI.1 ELASTICITIES OF DEMAND FOR SELECTED TRUNK ROUTES

Route group (distance in km)	*Real air fare*	*Real income*	*Population*	*Real price of alternative transport*	*Seasonal dummy variables*				$\bar{R}^2$	*DW*
					S1	*S2*	*S3*	*D4*[a]		
Short haul routes (less than 800 km)										
Sydney-Canberra	-0.49	0.34	..	-0.11	-0.08	-0.05	0.02	..	0.87	1.84
(237)	(-3.94)	(0.74)		(-0.67)	(-4.68)	(-2.43)	(1.00)			
Townsville-Cairns	-0.47	0.96	0.23	0.76	-0.07	0.05	0.18	..	0.75	1.95
(283)	(-1.98)	(1.69)	(0.05)	(4.31)	(-2.11)	(1.56)	(5.60)			
Melbourne-Canberra	-0.43	1.16	..	-0.09	-0.06	-0.03	-0.04	..	0.46	2.01
(470)	(-3.04)	(3.07)		(-0.87)	(-3.27)	(-1.28)	(-2.26)			
Brisbane-Rockhampton	-0.79	0.60	3.82	-0.16	-0.01	0.10	0.17	..	0.39	2.01
(520)	(-1.58)	(0.69)	(1.46)	(-0.72)	(-0.18)	(2.22)	(3.88)			
Melbourne-Adelaide	-1.17	3.43	..	-0.65	-0.02	-0.17	-0.08	-0.37	0.48	0.31[c]
(643)	(-1.64)	(2.34)		(-1.09)	(-0.17)	(-1.67)	(-0.74)	(-1.56)		
Sydney-Melbourne	-0.30	0.96	..	0.14	-0.02	-0.03	0.02	-0.06	0.50	1.64
(707)	(-1.70)	(2.38)		(1.32)	(-0.84)	(-1.34)	(0.71)	(-1.61)		
Sydney-Brisbane	-0.36	0.62	..	0.28	0.003	0.06	0.13	..	0.78	-0.20[c]
(747)	(-2.37)	(1.55)		(2.71)	(0.10)	(1.89)	(5.60)			
Medium-haul routes (800-1700 km)										
Brisbane-Canberra[b]	-0.91	1.00	-6.82	1.02	0.02	0.03	0.04	..	0.79	-1.55[c]
(951)	(-1.38)	(0.48)	(-2.77)	(3.75)	(1.91)	(2.83)	(4.57)			
Adelaide-Canberra	-0.80	0.57	..	0.89	-0.001	-0.06	0.04	-0.62	0.91	1.83
(972)	(-1.38)	(0.51)		(2.89)	(-0.01)	(-1.02)	(0.62)	(-6.69)		
Brisbane-Townsville	-0.26	0.75	..	0.19	-0.08	0.03	0.13	0.03	0.83	1.72
(1114)	(-1.57)	(3.32)		(1.31)	(-3.46)	(1.44)	(6.35)	(0.70)		
Sydney-Adelaide	-0.79	0.92	..	0.23	0.05	-0.003	0.04	..	0.79	1.77
(1166)	(-3.50)	(1.90)		(1.57)	(2.51)	(-0.12)	(2.28)			

TABLE VI.1 (Cont.) ELASTICITIES OF DEMAND FOR SELECTED TRUNK ROUTES

Route group (distance in km)	*Real air fare*	*Real income*	*Population*	*Real price of alternative transport*	*Seasonal dummy variables* S1	S2	S3	*D4*[a]	$\bar{R}^2$	*DW*
Adelaide-Alice Springs	-0.98	1.63	0.54	0.34	-0.02	0.08	0.25	..	0.82	1.24
(1316)	(-1.79)	(2.10)	(0.13)	(1.85)	(-0.72)	(2.40)	(7.31)			
Melbourne-Brisbane	-1.36	2.36	..	0.22	-0.12	-0.10	0.15	-0.26	0.90	2.20
(1376)	(-4.18)	(4.31)		(1.49)	(-3.37)	(-2.63)	(4.27)	(-4.72)		
Brisbane-Cairns	-0.62	1.36	2.25	..	-0.12	0.02	0.21	..	0.82	1.91
(1392)	(-1.26)	(1.94)	(1.55)		(-2.77)	(0.44)	(5.05)			
Brisbane-Mt Isa	-1.40	1.74	..	..	-0.05	-0.04	0.06	..	0.41	1.23
(1572)	(-4.21)	(3.94)			(-1.21)	(-0.89)	(1.38)			
Long-haul routes (over 1700 km)										
Adelaide-Perth	-0.44	0.87	..	0.09	0.04	-0.03	0.25	..	0.86	1.82
(2120)	(-0.94)	(1.27)		(0.43)	(1.58)	(-0.93)	(1.16)			
Adelaide-Darwin	-1.01	1.03	4.92	0.73	0.05	0.06	0.24	..	0.93	1.31
(2619)	(-2.38)	(2.40)	(4.34)	(5.02)	(1.40)	(1.48)	(6.44)			
Melbourne-Perth	-1.05	1.99	..	..	0.02	-0.16	-0.04	..	0.71	1.62
(2707)	(-1.19)	(3.88)			(0.47)	(-3.02)	(-1.06)			
Sydney-Darwin	-2.59	4.85	..	0.48	-0.18	0.12	0.33	-0.32	0.73	2.35
(3154)	(-1.52)	(2.37)		(0.66)	(-1.38)	(0.78)	(2.65)	(-1.61)		
Sydney-Perth	-3.54	2.52	..	..	-0.01	-0.57	-0.23	..	0.89	-1.17[c]
(3284)	(-2.36)	(2.32)			(-0.09)	(-4.96)	(-2.07)			
Brisbane-Perth[b]	-0.93	1.26	..	0.45	-0.09	-0.25	-0.20	-0.86	0.87	1.51
(3611)	(-1.57)	(2.20)		(1.26)	(-1.25)	(-3.60)	(-2.95)	(-7.15)		
'Summer holiday' (Tasmania)										
Melbourne-Devonport[d]	-0.19	1.01	..	0.45	0.21	-0.11	-0.15	..	0.77	1.44
(412)	(-1.11)	(1.86)		(0.94)	(3.82)	(-2.16)	(-3.34)			

TABLE VI.1 (Cont.) ELASTICITIES OF DEMAND FOR SELECTED TRUNK ROUTES

Route group (distance in km)	*Real air fare*	*Real income*	*Population*	*Real price of alternative transport*	*Seasonal dummy variables* S1	S2	S3	*D4*[a]	$\bar{R}^2$	*DW*
Melbourne-Launceston	-0.43	0.79	..	-0.36	0.06	-0.03	-0.04	..	0.89	1.46
(476)	(-1.89)	(1.85)		(-0.93)	(5.88)	(-2.71)	(-5.39)			
Melbourne-Hobart	-1.29	1.49	..	0.32	-0.03	-0.02	-0.02	..	0.82	1.78
(617)	(-5.02)	(4.27)		(0.86)	(-2.59)	(-2.59)	(-3.56)			
Sydney-Launceston[b]	-0.86	1.24	..	..	0.07	-0.06	-0.10	..	0.86	1.89
(915)	(-1.30)	(0.96)			(4.72)	(-3.92)	(-7.60)			
Sydney-Hobart[b]	-1.28	2.87	..	..	0.42	-0.24	-0.22	..	0.24	1.96
(1040)	(-1.65)	(0.91)			(1.77)	(-1.03)	(-0.94)			
'Winter sunspots' (Queensland)										
Sydney-Coolangatta[e]	-0.62	0.64	4.99	..	-0.05	-0.11	-0.03	..	0.84	1.10
(679)	(-1.21)	(0.61)	(1.14)		(-1.21)	(-2.55)	(-0.69)			
Melbourne-Coolangatta[b]	-1.28	2.07	..	0.85	-0.10	-0.14	0.36	..	0.91	1.51
(1330)	(-1.58)	(1.91)		(1.93)	(-2.66)	(-3.13)	(8.55)			
Sydney-Townsville[b]	-2.54	3.66	..	1.21	-0.29	-0.02	0.41	..	0.71	1.51
(1689)	(-1.45)	(1.32)		(1.38)	(-2.78)	(-0.14)	(4.05)			
Sydney-Cairns[b]	-1.33	3.19	-2.43	1.52	-0.40	-0.10	0.51	..	0.88	1.74
(1970)	(-0.77)	(1.36)	(-0.22)	(2.26)	(-5.60)	(-1.19)	(7.88)			

a. Route specific dummy variable.
b. Derived from a smaller data base.
c. Durbin h-statistic.
d. F27 and F28 service.
e. The cross-price elasticity with respect to regional air fare is 1.50. t-value 3.19.

.. Not applicable.

Note t-values indicating the statistical significance of the estimates are in brackets.

Source BTE estimates.

TABLE VI.2 ELASTICITIES OF DEMAND FOR TRUNK AIR SERVICES BY SUB-MARKET

Sub-market	*Real air fare*	*Real income*	*Real price of alternative transport*	*Seasonal dummy variables*			*Constant*	$\bar{R}^2$	*DW*
				S1	*S2*	*S3*			
Short-haul	-0.55	0.92	0.35	-0.04	-0.04	0.03	14.57	0.63	1.88
	(-3.18)	(1.81)	(2.98)	(-2.02)	(-1.81)	(1.87)	(35.43)		
Medium-haul	-0.73	1.38	0.51	-0.05	-0.01	0.13	12.97	0.87	2.04
	(-3.64)	(3.33)	(6.14)	(-2.35)	(-0.26)	(6.65)	(22.01)		
Long-haul	-0.82	1.37	0.26	0.02	-0.11	-0.01	7.15	0.86	1.11
	(-2.09)	(3.00)	(1.77)	(0.75)	(-4.00)	(-0.39)	(3.75)		
'Summer holiday'	-1.45	1.70	0.68	0.03	-0.03	-0.03	-0.04	0.94	..
(Tasmania)	(-5.00)	(2.15)	(1.14)	(2.15)	(-2.35)	(-3.97)	(-0.04)		
'Winter sunspots'	-2.37	1.70	..	-0.02	-0.02	0.03	1.72	0.96	..
(Queensland)	(-12.03)	(3.07)		(-2.69)	(-3.12)	(4.56)	(3.06)		

.. Not applicable.

Note t-values indicating the statistical significance of the estimates are in brackets.

Source BTE estimates.

TABLE VI.3 ELASTICITIES OF DEMAND FOR REGIONAL AIR SERVICES

State	*Real air fare*	*Real income*	*Regional population*	*Real price of alternative transport*	*Seasonal dummy variables* S1	S2	S3	*Constant*	$\bar{R}^2$	*DW*
New South Wales										
Less than 400 km	-1.07	0.04	0.63	0.69	-0.01	0.01	0.01	0.76	0.84	..
	(-4.24)	(0.43)	(9.98)	(3.69)	(-1.96)	(1.75)	(3.14)	(2.01)		
Greater than 400 km	-1.13	0.90	0.57	0.30	-0.08	-0.02	0.02	-2.04	0.97	..
	(-5.10)	(2.77)	(30.82)	(2.39)	(-6.35)	(-1.40)	(2.00)	(-1.07)		
Major regional	-0.92	0.05	..	0.05	-0.07	0.02	0.05	8.71	0.69	..
centres	(-4.00)	(0.10)		(0.28)	(-4.19)	(0.80)	(3.15)	(3.35)		
Minor regional	-1.33	1.09	..	0.44	-0.02	0.09	0.40	11.16	0.95	1.91
centres	(-6.77)	(3.71)		(6.95)	(-0.86)	(3.91)	(16.33)	(12.16)		
Central Coast area	-0.94	0.34	0.53	0.24	-0.01	-0.03	-0.01	11.92	0.34	1.91
	(-1.88)	(0.55)	(1.19)	(2.08)	(-0.41)	(-1.23)	(-0.50)	(16.90)		
North Coast area	-1.83	0.53	2.38	0.73	-0.10	0.02	0.03	5.61	0.71	1.97
	(-2.57)	(0.83)	(2.37)	(3.63)	(-4.95)	(0.96)	(1.04)	(2.99)		
EWA	-0.74	0.41	..	..	-0.003	0.002	0.01	1.34	0.94	..
	(-4.16)	(1.28)			(-1.15)	(0.52)	(2.76)	(4.48)		
ANSW	-1.63	0.73	0.71	0.52	-0.09	0.03	0.03	-2.57	0.87	..
	(-7.42)	(1.86)	(8.29)	(2.89)	(-6.76)	(1.99)	(1.93)	(-1.10)		
Total New South	-1.14	1.21	0.01	0.23	-0.06	0.02	0.13	10.18	0.85	1.74
Wales	(-4.02)	(3.03)	(0.12)	(2.33)	(-3.85)	(0.97)	(7.43)	(7.34)		
South Australia	-1.00	1.53	-0.14	0.94	-0.06	-0.02	-0.04	1.85	0.92	..
	(-5.64)	(2.56)	(-1.64)	(5.30)	(-2.54)	(-0.69)	(-1.88)	(0.51)		

TABLE VI.3 (Cont.) ELASTICITIES OF DEMAND FOR REGIONAL AIR SERVICES

State	*Real air fare*	*Real income*	*Regional population*	*Real price of alternative transport*	*Seasonal dummy variables*			*Constant*	$\bar{R}^2$	*DW*
					S1	*S2*	*S3*			
Western Australia	-0.86	0.61	2.12	0.36	-0.07	0.01	0.12	1.79	0.89	1.47
	(-1.05)	(1.25)	(3.56)	(1.89)	(-2.20)	(0.48)	(3.84)	(0.88)		
Queensland	-1.21	0.58	..	0.66	-0.31	0.12	0.14	5.11	0.70	1.99
	(-2.79)	(1.64)		(2.48)	(-6.39)	(2.13)	(2.82)	(5.06)		

.. Not applicable.

Note t-values indicating the statistical significance of the estimates are in brackets.

Source BTE estimates.

TABLE VI.4 ELASTICITIES OF DEMAND FOR COMMUTER AIR SERVICES

Distance	*Real air fare*	*Real income*[a]	*Regional population*	*Real price of alternative transport*	*Seasonal dummy variables* S1	S2	S3	*Constant*	$\bar{R}^2$	*DW*
New South Wales										
Less than 200 km	-2.54	2.70	1.20	0.28	-0.10	-0.06	-0.01	-24.12	0.92	..
	(-3.40)	(1.95)	(5.26)	(0.41)	(-1.29)	(-0.65)	(-0.11)	(-2.81)		
Greater than 200 km	-0.59	1.25	..	..	-0.02	-0.01	-0.01	0.32	0.99	..
	(-2.69)	(2.27)			(-3.00)	(-1.42)	(-1.48)	(0.63)		
South Australia										
Kangaroo Island	-0.60	2.98	1.97	0.27	0.10	-0.03	-0.10	-15.76	0.81	..
services	(-0.52)	(1.67)	(1.34)	(0.99)	(1.76)	(-0.49)	(-2.26)	(-2.06)		
Mainland services	-1.52	0.46	..	..	-0.12	-0.18	-0.08	4.92	0.64	..
	(-1.64)	(1.01)			(-1.38)	(-1.93)	(-1.02)	(3.36)		
Western Australia	-1.96	0.31	..	1.86	-0.001	-0.005	-0.001	..	0.83	1.45
	(-4.28)	(1.37)		(10.92)	(-0.07)	(-0.30)	(-0.09)			
Queensland	-0.81	0.88	..	0.12	-0.10	0.21	0.20	1.27	0.85	..
	(-4.67)	(0.47)		(0.18)	(-1.37)	(2.48)	(2.77)	(0.14)		
Victoria	-0.23	0.24	3.59	0.30	-0.04	0.03	0.08	-8.94	0.82	2.00
	(-1.15)	(1.93)	(2.64)	(1.80)	(-0.86)	(0.99)	(1.60)	(-1.62)		
Tasmania	-1.16	1.42	..	1.61	-0.07	0.004	0.06	6.46	0.88	2.06
	(-6.61)	(3.00)		(9.51)	(-1.07)	(0.07)	(0.99)	(2.97)		

a. Real income in these equations was real male average weekly earnings.

.. Not applicable.

Note t-values indicating the statistical significance of the estimates are in brackets.

Source BTE estimates.

TABLE VI.5 ELASTICITIES OF DEMAND FOR DOMESTIC AIR FREIGHT

State	Lagged demand	Real freight rate	Real income	D1[a]	Seasonal dummy variables S1	S2	S3	Constant	$\bar{R}^2$	DW
Trunk[b]	..	-0.12	1.35	0.15	-0.15	-0.09	-0.003	3.24	0.88	1.51
		(-1.45)	(4.06)	(4.19)	(-6.36)	(-3.84)	(-0.13)	(2.07)		
Regional	0.26	-0.12	..	0.96	-0.02	-0.02	0.005	6.41	0.97	-1.15[c]
	(3.78)	(-2.03)		(10.60)	(-0.40)	(-0.55)	(0.09)	(10.10)		
Commuter	..	-0.11	1.39	..	..	..	..	-0.29	0.39	1.81
		(-0.72)	(1.61)					(-0.39)		

a. A dummy variable was used for the period of IPEC's operation.
b. Includes IPEC Aviation.
c. Durbin h-statistic.

.. Not applicable.

Note t-values indicating the statistical significance of the estimates are in brackets.

Source BTE estimates.

APPENDIX VII FORECASTS

Table VII.1 contains the forecast average annual growth rates for individual trunk routes. Tables VII.2 to VII.4 contain the passenger forecasts for trunk, regional and commuter airline travel respectively. Table VII.5 presents the domestic air freight forecasts for the three market sectors and IPEC Aviation.

TABLE VII.1 FORECAST AVERAGE ANNUAL GROWTH RATES FOR TOTAL REVENUE PASSENGERS ON TRUNK ROUTES, 1985 TO 2000

(per cent per annum)

Route (distance in brackets)	*Year*[a]							
	1985		*1986-90*		*1991-95*		*1996-2000*	
	Low	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Short-haul routes (less than 800 km)								
Sydney-Canberra (237)	0.42	1.03	0.07	0.53	0.05	0.36	-0.12	0.19
Townsville-Cairns (283)	4.00	5.70	1.93	3.49	1.59	3.01	1.09	2.50
Melbourne-Canberra (470)	3.83	4.81	2.22	3.06	1.77	2.48	1.19	1.90
Brisbane-Rockhampton (520)	5.56	6.61	4.89	6.09	4.83	5.79	4.13	5.08
Melbourne-Adelaide (643)	-1.85	3.62	-0.88	5.38	0.89	3.62	0.89	3.62
Sydney-Melbourne (707)	2.85	4.16	1.65	2.72	1.54	2.24	1.06	1.76
Sydney-Brisbane (747)	3.31	4.25	1.67	3.08	1.32	2.54	0.79	2.01

TABLE VII.1 (Cont.) FORECAST AVERAGE ANNUAL GROWTH RATES FOR TOTAL REVENUE PASSENGERS ON TRUNK ROUTES, 1985 TO 2000

(per cent per annum)

Route (distance in brackets)	*Year*[a]							
	1985		*1986-90*		*1991-95*		*1996-2000*	
	Low	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Medium-haul routes (800-1700 km)								
Brisbane-Canberra (951)	3.87	6.69	1.22	3.67	0.96	3.08	0.38	2.49
Adelaide-Canberra (972)	1.62	3.52	0.13	1.78	0.01	1.50	-0.19	1.22
Brisbane-Townsville (1114)	2.68	3.49	1.45	2.18	1.16	1.80	0.79	1.43
Sydney-Adelaide (1166)	2.38	3.79	1.02	2.19	0.80	1.73	0.35	1.27
Adelaide-Alice Springs (1316)	5.70	7.83	3.17	5.02	2.65	4.18	1.77	3.30
Melbourne-Brisbane (1376)	7.19	9.96	3.75	6.04	2.97	4.82	1.78	3.62
Brisbane-Cairns (1392)	7.07	8.37	5.17	6.50	4.67	5.80	3.74	4.86
Brisbane-Mt Isa (1572)	4.27	6.46	2.09	3.82	1.65	2.94	0.78	2.07

TABLE VII.1 (Cont.) FORECAST AVERAGE ANNUAL GROWTH RATES FOR TOTAL REVENUE PASSENGERS ON TRUNK ROUTES, 1985 TO 2000

(per cent per annum)

Route (distance in brackets)	*Year*[a]							
	1985		*1986-90*		*1991-95*		*1996-2000*	
	Low	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Long-haul routes (over 1700 km)								
Adelaide-Perth (2120)	2.70	3.63	1.45	2.24	1.16	1.81	0.72	1.38
Adelaide-Darwin (2619)	9.15	11.47	7.06	9.56	6.84	9.01	5.78	7.94
Melbourne-Perth (2707)	6.02	8.03	3.31	4.97	2.63	3.95	1.63	2.95
Sydney-Darwin (3154)	18.28	25.41	9.44	15.08	7.45	12.00	4.55	9.00
Sydney-Perth (3284)	6.99	11.75	1.21	8.24	0.83	5.59	-1.66	3.00
Brisbane-Perth (3611)	1.83	5.19	0.72	3.29	1.30	2.66	0.67	2.03

TABLE VII.1 (Cont.) FORECAST AVERAGE ANNUAL GROWTH RATES FOR TOTAL REVENUE PASSENGERS ON TRUNK ROUTES, 1985 TO 2000

(per cent per annum)

Route (distance in brackets)	*Year*[a]							
	1985		*1986-90*		*1991-95*		*1996-2000*	
	Low	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
'Summer holiday' (Tasmania)								
Melbourne-Devonport (412)	2.26	4.83	1.29	3.30	1.77	2.80	1.27	2.29
Melbourne-Launceston (476)	2.32	3.09	1.28	1.92	1.02	1.53	0.63	1.14
Melbourne-Hobart (617)	2.47	5.76	0.99	3.50	1.29	2.75	0.55	2.00
Sydney-Launceston (915)	3.30	4.72	1.71	2.85	1.35	2.23	0.74	1.61
Sydney-Hobart (1040)	9.26	12.03	5.19	7.48	4.12	6.00	2.66	4.51

TABLE VII.1 (Cont.) FORECAST AVERAGE ANNUAL GROWTH RATES FOR TOTAL REVENUE PASSENGERS ON TRUNK ROUTES, 1985 TO 2000

(per cent per annum)

Route (distance in brackets)	*Year*[a]							
	1985		*1986-90*		*1991-95*		*1996-2000*	
	Low	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
'Winter sunspots' (Queensland)								
Sydney-Coolangatta (679)	10.00	10.13	8.86	9.65	8.72	9.31	7.84	8.43
Melbourne-Coolangatta (1330)	6.79	10.00	3.13	5.86	2.48	4.80	1.44	3.74
Sydney-Townsville (1689)	11.36	17.30	5.12	9.94	4.03	8.01	2.18	6.09
Sydney-Cairns (1970)	12.21	17.03	5.94	10.09	4.71	8.40	3.08	6.72

a. Year ending 31 December.

Source BTE estimates.

TABLE VII.2 FORECAST TRUNK AIRLINE PASSENGERS, 1985 TO 2000
('000 passengers)

Routes	*Scenario*	*Year* 1985	1990	1995	2000
Short-haul					
(less than 800 km)	High	5 125.7	5 975.2	6 768.6	7 534.4
	Low	5 042.7	5 388.5	5 780.7	6 081.0
Medium-haul					
(800-1700km)	High	1 473.1	1 811.7	2 165.7	2 503.3
	Low	1 449.2	1 655.6	1 859.3	2 017.8
Long-haul					
(over 1700km)	High	838.1	1 119.6	1 426.6	1 719.0
	Low	818.6	946.0	1 077.4	1 166.6
'Summer holiday'					
(Tasmania)	High	919.1	1 080.4	1 234.8	1 367.8
	Low	899.9	971.3	1 048.9	1 097.5
'Winter sunspots'					
(Queensland)	High	627.4	951.7	1 407.8	2 000.5
	Low	618.7	869.8	1 219.9	1 658.6
All sample routes	High	8 983.4	10 938.6	13 003.4	15 125.2
	Low	8 829.0	9 831.2	10 986.3	12 021.5
Total Australia	High	9 523.9	11 587.2	13 762.0	16 031.5
	Low	9 361.1	10 437.1	11 636.9	12 722.5

Source BTE estimates.

TABLE VII.3 FORECAST REGIONAL AIRLINE PASSENGERS, 1985 TO 2000
('000 passengers)

State	*Scenario*	*Year* 1985	1990	1995	2000
New South Wales					
Intrastate	High	700.7	784.6	864.2	937.0
	Low	689.5	722.7	746.4	758.9
Interstate[a]		416.0	497.3	578.5	659.8
Queensland[b]	High	108.2	109.8	110.0	110.2
	Low	106.5	99.8	93.5	87.6
Western Australia	High	430.7	584.6	782.3	998.5
	Low	424.3	539.0	668.4	797.7
South Australia	High	205.1	256.8	309.5	358.8
	Low	200.7	227.1	248.3	261.0
Northern Territory[a]		94.8	114.8	135.0	155.0
Australia[c]	High	1 955.5	2 347.9	2 779.5	3 219.3
	Low	1 931.8	2 200.7	2 470.1	2 720.0

a. Results based on a simple linear regression. Includes Sydney-Coolangatta patronage.
b. Growth rate based on one stable route only.
c. There are no regional airlines based in Victoria or Tasmania.

Source BTE estimates.

TABLE VII.4 FORECAST COMMUTER AIRLINE PASSENGERS, 1985 TO 2000
('000 passengers)

State	*Scenario*	*Year* 1985	1990	1995	2000
New South Wales	High	373.0	464.4	550.5	655.1
	Low	360.8	373.0	384.7	395.6
Victoria	High	125.8	159.0	200.0	245.7
	Low	125.0	151.4	182.4	214.6
Queensland	High	217.1	238.6	257.0	271.5
	Low	215.0	227.1	235.2	238.7
Western Australia	High	91.5	105.1	119.5	135.2
	Low	88.0	86.2	83.7	80.8
South Australia	High	108.2	173.2	267.6	384.7
	Low	106.3	154.9	218.0	283.0
Tasmania	High	40.2	50.8	61.8	72.7
	Low	39.1	43.1	46.0	49.1
Northern Territory[a]		52.0	82.3	112.2	142.5
Australia	High	1 007.8	1 273.4	1 568.6	1 907.4
	Low	986.2	1 118.0	1 262.2	1 404.3

a. Results based on a simple linear regression.

Source BTE estimates.

TABLE VII.5 FORECAST DOMESTIC AIR FREIGHT[a], 1985 TO 2000
('000 tonnes)

Market sector	*Scenario*	*Year*			
		1985	*1990*	*1995*	*2000*
Trunk[b]	High	153.8	186.6	219.2	249.1
	Low	152.6	178.7	202.7	222.5
Regional	High	6.9	7.1	7.1	7.2
	Low	6.9	6.9	6.8	6.8
Commuter	High	3.3	4.0	4.7	5.4
	Low	3.2	3.8	4.3	4.8

a. Excluding mail.
b. Includes IPEC Aviation.

Source BTE estimates.

APPENDIX VIII MAJOR STOPPAGES IN AIRLINES, 1974-84

Table VII.1 provides details of major stoppages affecting Ansett, TAA, EWA and ANSW for the period 1974-84. Unless otherwise indicated, these stoppages affected all routes and airports over the period of the dispute.

TABLE VIII.1 MAJOR STOPPAGES IN AIRLINES, 1974-84

Year	*Quarter*	*Airline affected*	*Details*[a]	*Period of stoppage*
1974	September	Ansett, ANSW, TAA, EWA	TWU-Refuellers	July 31, August 7-11, 22, 28, September 9, 27
1974	September	Ansett, ANSW, TAA	Storemen & Packers Pilots[b]	August 17-18 August 24
1974	December	Ansett, ANSW, TAA, EWA	Pilots	November 21-24
1976	September	Ansett, ANSW, TAA	Flight attendants	July 1-2
1977	June	Ansett, ANSW, TAA, EWA	Air Traffic Controllers	May 7-13
1977	June	Ansett, ANSW	Pilots	June 24-26
1977	June	TAA	Engineers	June 24-26
1978	June	TAA, EWA	Pilots	April 28-May 1
1978	December	Ansett, ANSW, TAA	TWU	December 16-21

TABLE VIII.1 (Cont.) MAJOR STOPPAGES IN AIRLINES, 1974-84

Year	*Quarter*	*Airline affected*	*Details*[a]	*Period of stoppage*
1979	March	Ansett, ANSW, TAA	Storemen & Packers	February 19-March 12
1980	March	Ansett, ANSW, TAA, EWA	TWU	February 20-March 6
1980	December	Ansett, ANSW, TAA, EWA	TWU-refuellers	November 12
1980-81	December/ March	Ansett, ANSW	PREIA	December 17-January 9
1981	December/ March	TAA	PREIA	December 12-February 12
1981	June	Ansett, ANSW, TAA	Flight attendants Flight attendants	April 23-29 April 14-May 1
1981	September	Ansett, ANSW, TAA, EWA	TWU-refuellers	July 24-28
1981	September	TAA, EWA	LAME	August 4-11

TABLE VIII.1 (Cont.) MAJOR STOPPAGES IN AIRLINES, 1974-84

Year	*Quarter*	*Airline affected*	*Details*[a]	*Period of stoppage*
1982	March	Ansett, ANSW	PREIA[c]	March 12-31
1982	June	Ansett, ANSW	PREIA[c]	April 1-2
1982	June	Ansett, TAA	TWU[d]	May 25
1982	December	EWA	Pilots	October 29-November 8
1983	March	TAA	Extortion Hoax[c]	January 8-9
1983	June	TAA, EWA	TWU-refuellers[c]	June 15-19 (delays)
1983	June	Ansett, ANSW, TAA	Pilots	June 20-24 (rolling stoppages)
1983	September	Ansett, ANSW, TAA	Pilots[b]	August 10-13
1983	December	Ansett, ANSW, TAA	Pilots	October 4-5

TABLE VIII.1 (Cont.) MAJOR STOPPAGES IN AIRLINES, 1974-84

Year	*Quarter*	*Airline affected*	*Details*[a]	*Period of stoppage*
1983	December	Ansett, ANSW, TAA, EWA	TWU-refuellers	October 12
1984	December	TAA	Engineers	November 29, December 7-17 (rolling stoppages)
1984	December	TAA	Flight attendants	December 10-13 (rolling stoppages)[e]

a. All routes/airports affected except where indicated.
b. Affected Canberra only.
c. Affected Sydney only.
d. Affected Perth only.
e. Flow on effects from these two disputes carried over to the period December 18 to January 25.

Sources Personal communications, Ansett, TAA and EWA.

APPENDIX IX ERROR LIMITS

Error limits were not considered specifically in this Paper in the comparison of elasticity estimates. It is important to recognise that confidence intervals can be derived for each elasticity estimate presented in Chapter 4. For example, Table IX.1 presents confidence intervals (that is, a lower and upper bound) for each fare elasticity estimate at the 10 per cent significance level for the sample of short-haul trunk routes. The relatively large variation of this interval about the estimated elasticity value largely reflects the small sample size (that is, 32 quarterly observations) associated with each estimated fare elasticity. These confidence intervals are shown for illustrative purposes only; however, similar confidence intervals can be prepared for each estimated elasticity value.

TABLE IX.1 CONFIDENCE INTERVALS FOR AIR FARE ELASTICITIES[a]

Route	*Fare elasticity*	*Lower bound*	*Upper bound*
Sydney-Canberra	-0.49	-0.71	-0.28
Townsville-Cairns	-0.47	-0.87	-0.06
Melbourne-Canberra	-0.43	-0.67	-0.19
Brisbane-Rockhampton	-0.80	-1.66	0.77
Melbourne-Adelaide	-1.17	-2.40	0.06
Sydney-Melbourne	-0.30	-0.59	0.00
Sydney-Brisbane	-0.36	-0.63	-0.10

a. Confidence intervals are at the 10 per cent significance level and are based on the t-statistic.

Note All figures have been rounded to 2 decimal places.

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ABBREVIATIONS

ABRD	Australian Bicentennial Road Development Program
ABS	Australian Bureau of Statistics
AIRQ	Air Queensland
ANA	Airlines of Northern Australia
ANR	Air Navigation Regulation
ANSW	Air New South Wales
APEX	Advance Purchase Excursion Fare
ASA	Airlines of South Australia
ATI	Ansett Transport Industries
AWA	Airlines of Western Australia
BTE	Federal Bureau of Transport Economics
DofA	Department of Aviation
DoT	Federal Department of Transport
DW	Durbin-Watson statistic
EWA	East-West Airlines
GDP	Gross Domestic Product
IAFC	Independent Air Fares Committee
IPEC	Interstate Parcel Express Company

LAME	Licensed Aircraft Maintenance Engineers
NIEIR	National Institute of Economic and Industry Research
PREIA	Professional Radio and Electronics Institute of Australia
RPT	Regular Public Transport
TAA	Trans Australia Airlines
TWU	Transport Workers Union
WATC	Western Australia Transport Commission