Competition and Regulation in Domestic Aviation: Submission to Independent Review

Occasional Paper

This Paper has been prepared as a submission to the Independent Review of Economic Regulation of Domestic Aviation. The approach followed in the submission has two parts. The first presents an analysis of the structure and performance of the airline industry under the existing system of economic regulation. The second considers the economic theory of industry structure and the general rationale for regulation and how they might be applied to the airline industry. From the performance analysis it is possible to identify areas in which performance might be improved and the theoretical considerations provide insights into possible ways in which that improvement might be achieved.

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

Occasional Paper 72

Competition and Regulation in Domestic Aviation:

Submission to Independent Review

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FOREWORD

On 7 March 1985 the Minister for Aviation, The Honourable Peter Morris M. P., announced that an Independent Review of Economic Regulation of Domestic Aviation would be undertaken, headed by Mr T. E. May.

An invitation was issued by Mr May to interested parties to make submissions on matters related to economic regulation, and this Bureau of Transport Economics (BTE) Paper has been prepared in response to that invitation.

The Paper was prepared in the Financial Assessment Branch of the Bureau, under the supervision of Mr D. Baussmann. Most of the work was undertaken by Mr I. Bickerdyke, Mr M. W. Ingham and Mr R. K. Starr, with assistance from other branch members and from staff in other branches in the Bureau.

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July 1985

CONTENTS

TABLES

FIGURES

SUMMARY

This Paper has been prepared as a submission to the Independent Review of Economic Regulation of Domestic Aviation.

The approach followed in the submission has two parts. The first presents an analysis of the structure and performance of the airline industry under the existing system of economic regulation. The second considers the economic theory of industry structure and the general rationale for regulation and how they might be applied to the airline industry. From the performance analysis it is possible to identify areas in which performance might be improved and the theoretical considerations provide insights into possible ways in which that improvement might be achieved.

The criteria of public interest and economic efficiency used as a standard for performance measurement are defined to include:

- safety
- technical efficiency
- allocative efficiency
- equity.

The particular emphasis in this submission is on technical and allocative efficiency.

The discussion in Chapters 2 and 3 draws attention to areas where the air transport sector has performed well, including:

- an excellent safety record;
- a wide variety of fare/service combinations, although the range of combinations may not represent optimal allocative efficiency as the extent of latent demand is not known;
- standard economy fares that are at similar levels to those of US airlines (provided recent fares and exchange rates are used in the comparison); and
- high load factors and reasonable aircraft utilisation.

Other positive factors include a reasonable industrial relations record, some degree of competition, and some operational flexibility. The nationally consistent fare formula may be seen as serving equity goals. The evidence also suggests that the airlines have probably achieved some of the general objectives of the two airline policy including long-term growth, reliability, relative stability and the use of modern aircraft. However, these objectives may not be compatible with a high level of economic efficiency and it is likely that their achievement may have involved substantial costs.

A number of areas of concern have been identified. It is possible that these may be a result of the current regulatory arrangements. The concerns include:

- fare setting, which for economy fares is cost based and not conducive to either technical or allocative efficiency;
- notwithstanding the similar levels of standard economy fares, and recognising the difficulties in making international comparisons, average fares, measured in terms of revenue per passenger-kilometre, were 45 per cent higher in Australia than fares in the United States in 1983-84, reflecting the wider range of fares in that country;
- profits are high and rising, suggesting the likelihood of monopoly factor rents to the suppliers of capital and indicating that current fare levels are too high in relation to costs;
- labour productivity appears to be low compared with similar sized United States airlines, although improving;
- the overall cost of supplying capacity appears to be higher in Australia than in the United States, reflecting a number of the factors mentioned above; and
- the diversity of services and schedules may not meet passenger demands.

In most of these cases, the evidence presented is not sufficient to prove conclusively that Australian performance is inadequate. Nevertheless it consistently suggests that there could be scope for a substantial improvement in performance, and consequently that the Independent Review should investigate the possibility of achieving improvements in some or all of these areas.

Other negative factors include the protection of the trunk airlines from some forms of business risk, the imposition of institutional rigidities by the regulatory framework, and the concentration of

capacity controls on aircraft usage, while ignoring the employment of other factors of production.

The chapter on industry structure theory briefly examines the traditional theory - perfect competition, monopoly, monopolistic competition and oligopoly - and the recent development of the theory of contestable markets. The existing structure of the domestic airline industry is identified as a collusive oligopoly, which, as a government-enforced cartel, would operate like a monopoly in many ways. The characteristics of such a market would be expected to include:

- lower output levels and higher prices compared with more competitive markets;
- excessive factor rewards, such as high profit and wage levels;
- technical inefficiency because firms do not produce at least possible cost;
- excessive non-price competition, notably in the form of sales promotion; and
- inadequate variety of types and qualities of service to meet consumer demands, particularly at the lower end of the market.

Some of these characteristics were identified in the analysis of trunk airline performance.

The factors that determine industry structure are also examined. These include economies of scale, barriers to entry, government policies, and the desire and ability of firms to gain market power. In the absence of government intervention in the airline industry, it is concluded that the industry would:

- exhibit economies with regard to route length, load factors and possibly networking, but few economies with regard to aircraft size;
- have low barriers to entry in the form of some sunk costs and possible increased risk levels for new entrants, but these are not considered to be high in relation to other industries; and
- have a tendency for firms to seek to gain market power, as in other industries.

In theory, firms in this type of market structure free from regulation would be expected to behave more efficiently than firms in the current industry. These efficiency gains would essentially be due to the

ability of firms to enter and leave the industry with little restriction (because of the low barriers to entry, low cost of exit and few economies of scale) and the competitive environment this creates.

A variety of reasons for a government to intervene in an industry are identified in Chapter 5. These include:

- allocative efficiency considerations such as control of monopolies, externalities, market imperfections and second best concerns;
- technical efficiency matters such as the promotion of competition and the prevention of wasteful resource use;
- destructive competition; and
- equity considerations.

However, many of these same reasons can also be used to argue against government regulation of an industry. In addition, both the government and the industry will incur financial costs caused by regulation, and these costs are a deadweight loss to the economy.

When considering an industry as a candidate for government intervention it is important to carefully balance the various costs and benefits, of both the need for intervention and its form. It is concluded that in most respects the airline industry is similar to many other industries in the economy and has no special characteristics which would invite intervention. In this situation, unrestricted entry and the promotion of competition are the main requirements for maximising efficiency in the industry. Government intervention may be justified to adjust for externalities (particularly safety), and to meet equity and consumer information requirements. However, because regulation can have many possible adverse consequences, particularly on efficiency and structural flexibility, it should only be used where other more efficient types of intervention (such as subsidies or taxes) are inappropriate.

The final chapter discusses several alternatives for improving the performance of the airline industry by changing the regulatory environment. The alternative of 'more regulation', by way of tightening up existing arrangements and closing loopholes, is assessed as unlikely to actually result in the required improvements in efficiency. The full deregulation alternative is also likely to have problems in the transitional phase from the existing regulated structure to the unregulated industry. However, experience with

deregulation in the United States, while not directly transferable to Australia, does indicate that efficiency improvements can be achieved by reducing the extent of regulation.

A preferred initial strategy involves the reform of regulation. However, the fundamental objective of this approach remains that of the deregulation option - to promote improved economic efficiency through increased competition. Economic theory emphasises that competition is seriously inhibited by artificial barriers to entry. The removal of legislative barriers to entry into the market is the essential element in any attempt to improve efficiency by following the competitive path.

Regulation would still be required to maintain safety standards and to control noise pollution. This is in addition to existing general industry regulation to promote competition and consumer protection. Some form of price monitoring and measures to prevent unfair competition from TAA and Ansett may also be justified in the short-term to prevent predatory pricing and exploitation of market power, although more work needs to be carried out to develop transitional mechanisms appropriate for these purposes. Therefore the strategy is one of initial regulatory reform, rather than immediate full deregulation.

Although the regulatory reform strategy may be perceived to have some adverse distributional consequences, it is possible to compensate for them. Where this may be judged desirable, the preferred form of compensation would be by way of direct subsidies.

The strategy put forward in this submission provides an opportunity for achieving the performance improvements required to promote efficiency in Australian airlines. The principle benefits that the Australian public might expect to see include:

- improved airline technical efficiency leading to lower costs;
- wider availability of discount fares and a reduction in the conditions attached to discount fares, which would particularly benefit non-business travellers;
- innovative marketing and route strategies, including holiday charters, walk-on shuttle services, and low fare/low service flights similar to those available in the United States; and
- services that are more flexible, and can be better adapted to changing consumer demands, as new entrant airlines attempt to find market niches not covered by existing operators.

In summary, economic theory suggests that promotion of competition by the removal of legislative barriers to entry into the domestic aviation market is the best way to achieve improved efficiency. The practical evidence also consistently suggests that movement towards this objective would result in airline services which better serve the public interest.

CHAPTER 1-INTRODUCTION

On 7 March 1985 the Federal Minister for Aviation, The Honourable Peter Morris, M. P., announced that an Independent Review of Economic Regulation of Domestic Aviation would be undertaken, headed by Mr T. E. May.

The Terms of Reference for the review are set out in Appendix I of this submission. In general, the Terms of Reference require a review of the existing arrangements for economic regulation and advice on possible options for future regulatory arrangements for Government consideration.

The review procedure included an invitation for interested parties to make submissions on matters related to economic regulation and this BTE Paper has been prepared in response to that invitation. The approach followed in the submission has two parts. The first is an analysis of the structure and performance of the airline industry under the existing system of economic regulation. The second considers the economic theory of industry structure, the general rationale for regulation and how they might be applied to the airline industry. From the performance analysis it is possible to identify those areas in which performance might be improved. The theoretical considerations provide insights into possible ways in which that improvement might be achieved. This work provides the basis for identifying directions in which the regulatory framework might be changed or reformed to promote improved performance.

This chapter contains a brief discussion of the criteria of public interest and economic efficiency used as a standard for performance measurement in the submission. In Chapter 2, the structure of the Australian domestic airline market is described in terms of the regulatory framework and demand and supply characteristics, with conclusions drawn by way of emerging trends in the market structure. The performance of Australian airlines is analysed in Chapter 3 using the criteria of allocative efficiency, technical efficiency, and to a lesser degree, safety and equity. The conclusions highlight those areas where there appears to be scope for performance improvements.

Chapter 4 examines the factors that appear to be important in the determination of industry structure from a theoretical viewpoint, and their application to the airline industry. This is used to explain the current industry structure and the underlying economics of the industry.

The arguments advanced for and against the intervention of government in an industry are discussed in Chapter 5, and again are applied to domestic aviation in Australia. The final chapter takes the conclusions drawn in the earlier chapters and presents a pragmatic approach to the regulation of domestic airlines which should lead to improved performance.

The text is supplemented by a number of appendixes which contain more detail on such aspects as the theory of contestable markets, airline cost concepts and relationships and the current regulatory framework.

PUBLIC INTEREST AND ECONOMIC EFFICIENCY

In assessing the performance of Australian airlines and approaches to performance improvement, it is important to define the criteria to be used as a basis for measurement.

The Terms of Reference require the Review to have regard to, and report upon the impact of, inter alia, the public interest and the economic efficiency implications of future options for economic regulation of the industry. These two concepts, the public interest and economic efficiency, provide a framework for developing criteria for performance measurement.

There is no clear and comprehensive definition of the public interest that would satisfy all points of view. The perceptions of individuals and organisations of what is in the public interest are undoubtedly coloured by the self-interest of those individuals and organisations. However, there are certain dimensions of public interest on which most observers of the domestic airline industry would probably agree. These are:

- safety
- efficiency
- equity.

The concept of safety is relatively straightforward (although its implementation is a complex and expensive matter). It concerns the

minimisation of risk of death and injury or damage to personal property.

Efficiency, however, is not so easy to define. From an economic viewpoint, efficiency has two aspects:

- technical efficiency, which is concerned with obtaining the maximum output from a given bundle of resources (or to put the same thing in another way, the production of a given output at least possible cost);
- allocative efficiency, which is concerned with the mix of outputs in an economy being such that no other mix would increase welfare, and consequently ensuring that sufficient resources are allocated to an industry so that consumer demands are met at prices that reflect the costs of those resources.

Technical efficiency tends to be easier to measure than allocative efficiency in the sense that output and quantities and values of inputs, are usually not difficult to identify. Allocative efficiency in the aviation industry is related to such questions as the availability of a variety of price/service combinations to meet the varied demands of consumers and the degree to which prices reflect the underlying social cost structure of airline services.

Equity is a much more difficult concept, and depends very much on the philosophical viewpoint of the observer. It might be argued, for example, that equity is best served by seeking economic efficiency with no regard for the consequences. On the other hand, equity might be seen as the objective of ensuring all members of society have certain minimum living standards, or of encouraging specific patterns of income distribution. In the airline industry, equity concerns may be manifested in the use of subsidies designed to benefit particular groups perceived as disadvantaged, or in the use of a nationally consistent fare formula which ensures that all passengers travelling the same distance face the same economy air fare.

In this submission, the performance of the airline industry has been measured against standards of safety and technical and allocative efficiency. Likewise, the discussion of theoretical aspects of industry structure and the rationale for regulation is presented in terms of the impact on technical and allocative efficiency. It is not possible to apply the same approach using the equity criteria, because of the absence of a universally agreed equity objective. However, the discussion does cover distributive consequences where they can be identified.

The economic efficiency of the airline industry is a consistent theme throughout this submission - how the industry has performed in the existing regulatory framework, and how the industry structure and government intervention might be changed to improve efficiency. The submission has been prepared from the viewpoint that efficiency and structural flexibility are the most important aspects of the public interest in aviation (provided safety is not jeopardised).

CHAPTER 2-STRUCTURE OF AUSTRALIAN AIR TRANSPORT MARKET

This chapter discusses the structure of the Australian air transport market. The regulatory framework is first outlined and the structure of the industry then described in terms of demand and supply characteristics. There is also a discussion of inter-modal competition.

REGULATORY FRAMEWORK

Airline operations in Australia are undertaken in an environment of various forms of government regulation covering safety and economic conditions.

Safety regulations are administered by the Commonwealth Department of Aviation in the form of the Air Navigation Regulations and apply to intrastate, interstate and international aviation.

Economic regulation is concerned with the economic structure and conduct of the airline industry. At the interstate and international level the regulation is administered by the Commonwealth, while State governments have the power to control intrastate operations (although not all States use this power).

The primary feature of the economic regulation of interstate airline operations is the two airline policy and the framework of legislation that supports it. The important parts of the framework are:

- *Airlines Agreement Act 1981*
- *Airlines Equipment Act 1958-1973*
- *Independent Air Fares Committee Act 1981*
- *Australian National Airlines Act 1945*
- Customs (Prohibited Imports) Regulations.

The Airlines Agreement is the basis of the two airline policy. In it, the Commonwealth Government, Ansett Transport Industries (Ansett)

and the Australian National Airlines Commission (TAA)[1] agree to act to ensure that only Ansett and TAA operate on trunk airline routes and to prevent competition by any other airline on those routes. The Agreement does permit some peripheral competition as air freight is excluded, it is possible to combine some regional routes to provide an indirect service on trunk routes (that is, prescribed routes) and provision is made for 'specialised' services not provided by TAA and Ansett. Collusion between TAA and Ansett is also permitted and in fact is required on questions of load factors and aircraft utilisation to encourage rationalisation of aircraft capacity. The current Agreement became operational in 1982, and cannot be terminated before January 1990.

To prevent other potential operators from importing aircraft, the Agreement requires the Commonwealth Government to use its power to refuse permission for the importation of aircraft, airframes and aircraft engines under the Customs (Prohibited Imports) Regulations where they may be used to compete with Ansett and TAA.

The purpose of the *Airlines Equipment Act 1958-1973* is to control the capacity supplied by TAA and Ansett (and by any other airline operating passenger jet aircraft). The Act works by providing for an estimate of future passenger traffic to be made, and for a maximum aircraft capacity to be set, so that Ansett and TAA each provide a maximum of 50 per cent of this capacity[2]. Ansett and TAA are under an obligation to adjust their capacity to meet this determination. Capacity determinations have also been set for East-West Airlines and for Ansett's regional airlines[3].

The *Independent Air Fares Committee Act 1981* allows the committee of the same name to control the fares offered by airlines. The fare setting procedure involves cost allocation reviews to attribute costs to flag-fall or distance components, air fare reviews to determine the level of fares within the flag-fall/distance formula and approval of discount air fares. The Act ensures that TAA and Ansett both offer identical economy fares, although there is provision for different discount fares to be offered. The IAFC Act applies to both intrastate and interstate operators.

The *Australian National Airlines Act 1945* provides for the setting up

1. Trans Australia Airlines is the trading name of the Commission.
2. On the basis of standard load factors and aircraft utilisation.
3. Future determinations for TAA will include its recently acquired subsidiary Air Queensland.

and operation of the Commonwealth Government owned Trans Australia Airlines (TAA). Essentially, TAA is required to operate on a commercial basis as one of the two designated trunk airlines in Australia, although there remains some ministerial and parliamentary control over financial aspects of its operations.

Thus these pieces of legislation provide a comprehensive framework for the regulation of Australian trunk airlines. They are discussed in greater detail in Appendix II and in other relevant parts of this submission. The resultant regulatory framework can be summarised as follows:

- a legislated duopoly on trunk routes comprising a government-owned and a privately-owned airline;
- provision for collusion between the two airlines;
- entry by other operators in most cases prevented by import controls and capacity constraints (except for prescribed routes or specialised services);
- price control to ensure that both airlines offer identical economy fares;
- capacity control so that each airline provides 50 per cent of available capacity on trunk routes; and
- some scope for competition by the trunk airlines on discount fares and between trunk and regional operators on prescribed routes or specialised services.

In 1957, for an earlier version of the Agreement, the rationale was seen as the need to avoid wasteful competition between the two airlines, while ensuring growth and stability in the trunk route network and financial security for the airlines. The benefits were expected to include safety, reliability, stability and the use of modern equipment. In 1978, the domestic air transport policy was reviewed by a committee which subsequently recommended increased scope for competition while maintaining the essential features of the previous policy.

The regulation of intrastate services by State governments is also described in Appendix II. In brief, forms of entry control or route licensing are used in New South Wales, Queensland, Western Australia, Tasmania and the Northern Territory, while there are no entry controls for airline services within the States of Victoria and South Australia.

DEMAND CHARACTERISTICS

Market size

The domestic air passenger market has shown a general upward trend over the post-war period, although there have been intervals of slower growth or traffic downturns due to factors such as economic recession. The long-run increase in passenger traffic is the result of several influences including rising population and increases in average income levels.

The growth of domestic airline passenger embarkations in Australia between 1944-45 and 1984-85 is illustrated in Figure 2.1. Embarkations rose from 320 000 passengers to 11.3 million passengers over this period. This represents an average compound growth rate of 9.3 per cent per annum[1].

Table 2.1 provides information on the change in embarkations in five-year intervals between 1944-45 and 1984-85. The fastest growth rate during this period was achieved between 1944-45 and 1949-50, although this was from a very small base. The average annual growth rate fell to 5 per cent in the next five-year period but gradually increased to

TABLE 2.1-CHANGE IN DOMESTIC AIRLINE EMBARKATIONS OVER FIVE-YEAR PERIODS, 1944-45 TO 1984-85

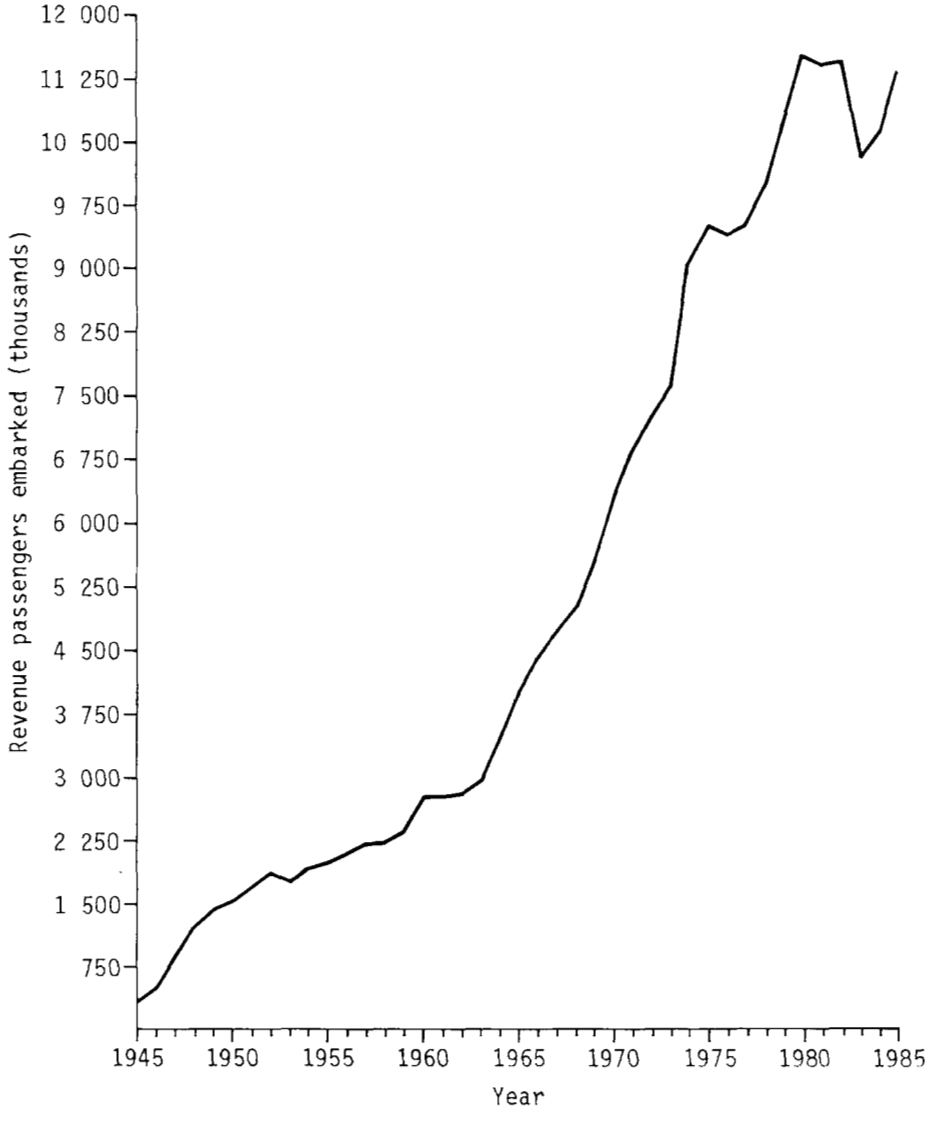
(per cent)

Period	*Average annual compound growth*
1944-45 to 1949-50	37
1949-50 to 1954-55	5
1954-55 to 1959-60	7
1959-60 to 1964-65	8
1964-65 to 1969-70	10
1969-70 to 1974-75	9
1974-75 to 1979-80	4
1979-80 to 1984-85	0

Sources: Derived from Department of Civil Aviation (1945-73). Department of Transport (Domestic Air Transport Statistics, various years). Department of Aviation (Domestic Air Transport Statistics, various years).

1. By comparison, the figure for the corresponding carrier groups in the United States (trunk and local service airlines) between 1946 and 1982 was 10.2 per cent per annum.

reach 10 per cent between 1964-65 and 1969-70. It fell substantially after 1974-75 and historically low growth rates were then recorded. There was a 0.3 per cent average annual decline in passenger numbers between 1979-80 and 1984-85, mainly as a result of falls in traffic in 1980-81 and 1982-83. However, traffic began to recover towards the end of this five-year period.



Source: Air transport statistics published by the DCA, DoT and the DofA.

Figure 2.1-Revenue passengers embarked on trunk and regional airline services, 1944-45 to 1984-85

Market sectors

The domestic air passenger market is divided into trunk, regional and commuter routes. The trunk routes comprise the markets between State and Territory capitals plus a number of other major centres[1] (as defined in the Airlines Agreement). Regional routes cover the remaining services operated by domestic airlines, usually between State capital cities and certain large regional towns. Commuter routes involve regular passenger operations where aircraft with up to 38 seats and 4200 kilogram maximum payload are used.

Table 2.2 presents data on traffic levels in the three route categories between 1974-75 and 1983-84. Trunk traffic grew at an average compound rate of 1.9 per cent per annum over this period and the proportion of total traffic carried on these routes increased marginally from 80.6 per cent to 80.8 per cent. The rate of change for regional routes was -2.7 per cent per annum and their share of total passengers fell from 16.6 per cent to 11 per cent[2].

Commuter routes had the most rapid increase in activity with a compound annual growth rate of 14.6 per cent between 1974-75 and 1983-84. Commuter traffic more than tripled over this period despite a reduction in passengers in 1983-84. This increase reflected the growth of existing services, establishment of new routes and the replacement of regional operators on some routes. The proportion of total traffic carried on commuter routes increased from 2.8 per cent in 1974-75 to 8.2 per cent in 1983-84.

Specific routes

There has been significant variation in developments on individual routes within the three market sectors. Detailed information on selected trunk, regional and commuter routes is presented in Appendix III.

The number of passengers carried on the 20 highest density trunk routes generally fell between 1979-80 and 1983-84. Changes varied from a fall of 28 per cent on the Adelaide-Perth route to a rise of

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1. Alice Springs, Cairns, Coolangatta, Gove, Launceston, Mackay, Mt Isa, Proserpine, Rockhampton and Townsville.
2. As it was not possible to estimate trunk and regional components for some services, all traffic was attributed to the classification considered to account for the majority of passengers on each service. The data therefore marginally overestimate trunk traffic and underestimate regional traffic.

TABLE 2.2-NUMBER OF PASSENGERS BY MARKET SECTOR, 1974-75 TO 1983-84
('000 passenger embarkations)

	Sector			
Year	*Trunk*	*Regional*	*Commuter*	*Total*
1974-75	7 885	1 624	278	9 787
1975-76	7 868	1 548	333	9 749
1976-77	7 784	1 719	418	9 921
1977-78	8 445	1 844	503	10 792
1978-79	8 821	1 900	603	11 323
1979-80	9 828	1 677	701	12 206
1980-81	9 789	1 592	827	12 208
1981-82	9 939	1 457	964	12 360
1982-83	9 060	1 273	970	11 303
1983-84	9 330	1 272	949	11 551

Sources: Department of Transport (Domestic Air Transport Statistics, various years).
Department of Aviation (Domestic Air Transport Statistics, various years).

185 per cent between Sydney and Perth[1]. Two of the five highest density regional routes had substantial increases in traffic and three had declines over this period. The five highest density commuter routes all exhibited rapid growth.

Traffic densities are generally highest on the trunk routes. Sydney-Melbourne and Sydney-Brisbane accounted for 34 per cent of trunk passengers in 1983-84 and the five highest density routes carried 50 per cent of trunk traffic. Passenger numbers on the highest density regional services are similar to those on the low density trunk routes. Commuter routes are generally the least dense, although the Sydney-Belmont corridor has higher traffic levels than any of the regional markets.

Fare and income responsiveness

The BTE has prepared estimates of fare and income elasticities for 29 trunk routes which represented 93 per cent of total trunk airline travel in 1984. Demand for trunk air travel on individual routes was

1. As the data are based on uplifts and discharges within each flight number, changes in service patterns could affect reported traffic growth on individual routes.

expressed as a function of seasonal and socio-economic factors such as level of economy air fare, income, the cost of alternative transport modes and population[1].

In general, the passenger demand relationships were derived from an econometric analysis of time series data (between the March quarter 1977 and the December quarter 1984). The method of ordinary least-squares regression was used to estimate the parameters of the models.

On the whole, the estimated regression models provided good explanations of the quarterly variations in trunk air travel. Almost all of the estimated elasticities for air fare and income were of the expected signs and were statistically significant. Further, the demand elasticities appeared to have a consistent pattern. The estimates of fare and income elasticities are presented in Table 2.3.

The elasticity estimates were based on uplift-discharge data rather than origin-destination data, and as a result changes in service patterns may affect some of the estimates. This is a particular problem with the Adelaide-Perth and Sydney-Perth routes, where the incidence of direct flights has increased substantially.

For the two highest density direct links (Melbourne-Sydney and Sydney-Brisbane) where business travel is expected to be important, the fare elasticities were -0.30 and -0.36 respectively. This indicates a more inelastic demand than on other less dense routes. In general, travel from the three southern cities of Canberra, Melbourne and Adelaide to Queensland and to a lesser extent travel to Tasmania was found to be responsive to air fare changes (that is, absolute magnitude of elasticities greater than 1.0).

Excluding air travel on holiday routes, air fare elasticity appears to increase with the length of the route. This suggests income effects: that is, the cost of travel becomes sufficiently high that changes in air fares affect travellers' total budgeting and result in significant changes in the decision of whether or not to travel by air on long-haul routes.

Table 2.3 also reports the weighted average fare elasticities for routes grouped into short-haul (less than 800 kilometres), medium-haul

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1. That is,
   Demand = f (seasonal and service quality dummies, air fare, income, population, cost of car travel, cost of coach travel, cost of ship travel to Tasmania).

TABLE 2.3-FARE AND INCOME ELASTICITIES FOR SELECTED TRUNK ROUTES

Routes	*Fare elasticity*[a]	*Income elasticity*[b]
Short haul (less than 800 km)		
Sydney-Canberra	-0.49	0.34
Townsville-Cairns	-0.47	0.96
Melbourne-Canberra	-0.43	1.16
Brisbane-Rockhampton	-0.79	0.60
Melbourne-Adelaide	-1.17	3.43
Sydney-Melbourne	-0.30	0.96
Sydney-Brisbane	-0.36	0.62
Group[c]	-0.48	1.15
Medium haul (800-1700km)		
Brisbane-Canberra[d]	-0.91	1.00
Adelaide-Canberra	-0.80	0.56
Brisbane-Townsville	-0.26	0.75
Sydney-Adelaide	-0.79	0.92
Melbourne-Brisbane	-1.36	2.36
Brisbane-Cairns	-0.62	1.36
Brisbane-Adelaide[e]	-1.25	2.88
Group[c]	-0.82	1.38
Long haul (over 1700km)		
Adelaide-Perth	-0.44	0.87
Adelaide-Darwin	-1.01	1.03
Melbourne-Perth	-1.05	1.99
Sydney-Darwin	-2.59	4.85
Sydney-Perth	-3.54	2.52
Brisbane-Perth	-0.93	1.26
Group[c]	-1.52	1.80
Summer holiday (Tasmania)		
Melbourne-Devonport	-0.19	1.01
Melbourne-Launceston	-0.43	0.79
Sydney-Launceston	-0.86	1.24
Melbourne-Hobart	-1.29	1.49
Sydney-Hobart	-1.28	2.87
Group[c]	-0.86	1.29

TABLE 2.3 (Cont)-FARE AND INCOME ELASTICITIES FOR SELECTED TRUNK ROUTES

Routes	*Fare elasticity*[a]	*Income elasticity*[b]
Winter sunspots (Queensland)		
Sydney-Coolangatta	-0.62	0.64
Melbourne-Coolangatta	-1.28	2.07
Sydney-Townsville	-2.54	3.66
Sydney-Cairns	-1.33	3.19
Group[c]	-0.91	1.28
All routes[c]	-0.70	1.27

a. Indicates percentage change in number of passenger journeys resulting from a 1 per cent change in air fares.
b. Indicates percentage change in number of passenger journeys resulting from a 1 per cent change in disposable income.
c. Weighted average on basis of patronage in 1984.
d. Derived from a smaller data base.
e. BTE (1982).

(800 kilometres to 1700 kilometres), long haul (more than 1700 kilometres) and the more leisure-dominated Tasmanian (summer holiday) and Queensland (winter sunspots holiday) routes. In addition to substantiating the above conclusions, this grouping sheds further light on the variation of air fare elasticity with the purpose of travel. Travel on holiday routes is the most sensitive to changes in fares, and within these groups travel to winter sunspots is more responsive than travel to Tasmania[1].

Trunk travel forecasts

To estimate trunk airline passenger movements between 1985 and 2000, the future likely levels of the variables affecting demand (air fare, income, cost of alternative transport modes, population and so on) had to be established. Values were assigned to these variables 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, whilst the other assumed

1. The exception within the winter sunspots group is the Sydney-Coolangatta route. Demand for air travel on this route was found to be sensitive to changes in regional airline fares, suggesting competition between trunk and regional carriers.

adverse conditions. The two scenarios established the bounds for the high and low growth forecasts respectively. The first scenario assumes that there will be a constant modest increase in real air fares and relatively high growth rates in GDP (or income) and population. By contrast, the second scenario assumes higher increases in air fares in real terms and relatively lower growth rates in GDP (income) and population. The other variables in each scenario were also given values consistent with the optimistic or pessimistic conditions.

Details of the high and low growth forecasts of trunk airline travel and the underlying projected growth rates of the scenario components are summarised in Table 2.4. These two sets of forecasts provide upper and lower bound estimates based on a continuation of the recent regulatory framework[1]. Trunk airline passenger movements are anticipated to increase from slightly over 9 million in 1984 to between 12.3 million and 16.7 million movements in 2000 under the low and high growth forecasts respectively.

Traffic over the last 10 years and the forecasts are shown in Figure 2.2. The broad observations to be made include:

- continued growth in trunk air travel to the end of the century;
- under the high growth forecast, an increase in trunk airline travel of 85 per cent (around 3.9 per cent per annum) between 1984 and 2000;
- under the low growth forecast, an increase in trunk airline travel of 37 per cent (nearly 2.0 per cent per annum) between 1984 and 2000.
- future growth at lower annual rates than those which prevailed in the 1970s; and
- growth generally 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 this century.

Passenger characteristics

Information on airline passenger characteristics was obtained during a survey of TAA, Ansett and East-West Airlines passengers travelling on selected domestic trunk routes in the first half of 1983 (BTE 1985a).

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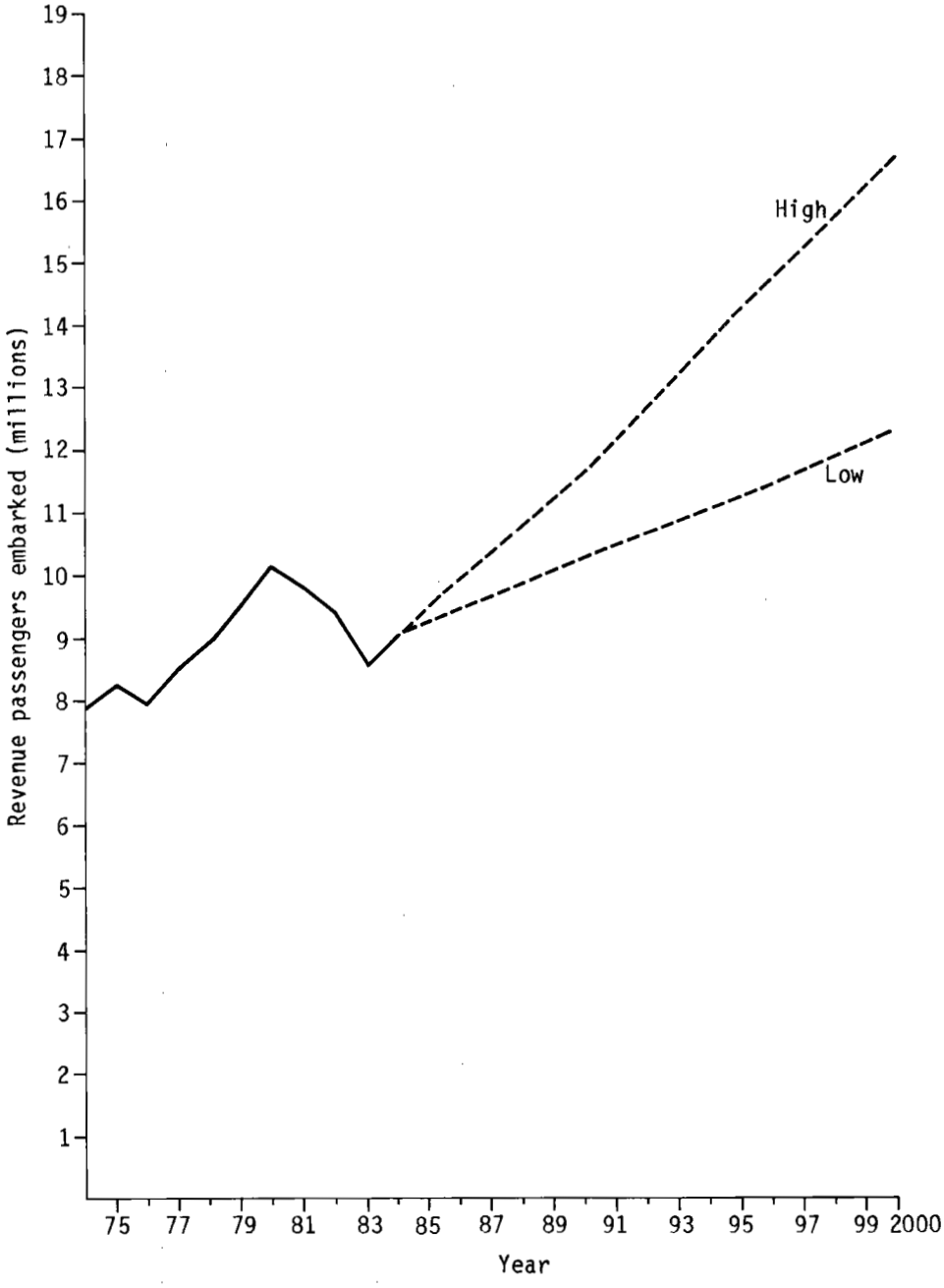
1. If the regulatory framework was significantly changed, future trends in the air passenger market would be different.



Source: Air transport statistics published by DoT and DofA, BTE estimate.

Figure 2.2-Revenue passengers embarked by trunk airlines, recent trend and forecasts to 2000

TABLE 2.4-FORECASTS OF GROWTH IN TRUNK AIRLINE PASSENGER MOVEMENTS UNDER HIGH AND LOW GROWTH SCENARIOS, 1984 TO 2000

(per cent per annum)

	Period			
Forecasts/scenarios	*1984 to 1985*	*1985 to 1990*	*1990 to 1995*	*1995 to 2000*
High growth				
Traffic growth forecast	5.6	4.1	4.0	3.3
Scenario components				
Air fares[a]	1.0	1.0	1.0	1.0
GDP[a]	4.5	3.5	3.5	3.0
Population	1.3	1.3	1.2	1.1
Cost of car travel[a]	2.0	1.0	1.0	1.0
Coach fares[a]	1.0	1.0	1.0	1.0
Sea fares[a]	1.0	1.0	1.0	1.0
Low growth				
Traffic growth forecast	2.7	2.2	1.7	1.9
Scenario components				
Air fares[a]	1.9	1.6	1.6	1.3
GDP[a]	3.0	2.5	2.0	2.0
Population	1.1	1.1	1.0	0.9
Cost of car travel[a]	1.0	0.0	0.0	0.0
Coach fares[a]	-3.0	-2.0	0.0	0.0
Sea fares[a]	-3.0	-2.0	0.0	0.0

a. In real terms.

The survey results indicated that TAA and Ansett full fare passengers were essentially male, middle-aged business travellers from medium/high income households. In contrast, TAA/Ansett discount fare passengers were essentially private travellers and there were higher proportions of females, young (under 20 years) and old (over 64 years) persons and low income earners. East-West passengers exhibited similar characteristics to the trunk airline discount travellers. These passenger profiles suggest that the introduction of discount fares has benefited lower income private travellers.

The survey showed that persons travelling for business purposes were a much higher proportion of passengers on TAA and Ansett services than on East-West flights. In addition, East-West passengers booked their

tickets earlier and stayed at their destination for a longer period than travellers on the other airlines.

Data on the proportions of travellers in different fare categories indicate that between August 1981 and September 1983 approximately 8 per cent of passengers travelled on first class fares and a further 50 per cent paid full economy fares. The remaining 42 per cent of travellers bought discount and concessional fares. Half-price economy fares for children accounted for 8 per cent of total demand and the proportion of total passengers travelling on Apex fares was estimated at 8 per cent. Excursion 45 and Flexi-Fare travellers accounted for a further 7 per cent of the market.

SUPPLY CHARACTERISTICS

Industry participants

Services on the trunk routes are mainly operated by the two designated trunk airlines, Ansett and TAA. Most of the regional markets are serviced by a group of regional airlines which comprises Air New South Wales, Airlines of Northern Australia (ANA), Airlines of South Australia (ASA), Ansett WA (AWA), Air Queensland and East-West Airlines. These carriers conduct scheduled services under full airline licences.

Commuter services are operated by a group of 44 commuter airlines. These carriers do not hold full airline licences but generally have supplementary airline licences. In some cases, they operate under Air Navigation Regulation 203[1].

Passenger services are also provided by charter operators[2]. One of the largest charter operations is run by Lloyd Aviation which provides services under contract to the oil and gas industry in north-east South Australia and south-west Queensland.

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1. Commuter airlines commenced operations in 1967 through the granting of exemptions under ANR 203. This system was replaced by supplementary airline licences from February 1983. These licences authorise scheduled services using aircraft with a maximum capacity of 38 passengers or a 4200kg payload. Some commuter airlines continue to operate under ANR 203 which has been retained to allow exemptions from supplementary airline licence operating standards in exceptional circumstances.
2. These operations involve the commercial carriage of passengers and/or freight but are either unscheduled or not directly available for use by members of the general public. They are not included in the statistics presented in this chapter.

Ownership

Table 2.5 indicates that ownership of the larger airlines is relatively concentrated, with three companies controlling 100 per cent of the airline sector.

TAA has been owned by the Commonwealth Government since its formation in 1945. In early 1985 it acquired Air Queensland (previously Bush Pilots Airways) which had obtained an airline licence in 1980. Air Queensland had previously been owned by a group of mining companies and other institutions. Ansett also held around 19 per cent of Air Queensland prior to the TAA takeover.

The foundation for the present Ansett operation was formed in 1957 when Ansett Transport Industries acquired Australian National Airways. Ansett was a broadly held public company until the late 1970s when several groups acquired major interests. Thomas Nationwide Transport (a diversified transport company) and News Corporation (a major media owner) obtained joint control in 1979.

Several regional airlines are operating divisions of Ansett Transport Industries (Operations) Pty Ltd. The predecessors of Air New South Wales and Airlines of South Australia were acquired in 1958 and 1959 respectively. The takeover of Ansett WA (formerly MacRobertson Miller and Airlines of Western Australia) was completed in 1968. Airlines of Northern Australia commenced operations in 1981 when it took over

TABLE 2.5-OWNERSHIP OF MAJOR AUSTRALIAN AIRLINES, 1985

Airline	*Owner*	*Associated Airlines*
Ansett Airlines of Australia	Ansett Transport Industries (Operations) Pty Ltd	Air New South Wales Airlines of Northern Australia Airlines of South Australia Ansett WA
Trans Australia Airlines	Commonwealth Government	Air Queensland
East-West Airlines	Private	Skywest Airlines East Coast Airlines[a]

a. East-West shareholding is 26 per cent.

services previously operated by Northern Airlines (a subsidiary of East-West Airlines).

East-West Airlines was formed in 1946. It had a broad spread of shareholders until 1982 when it was taken over by East-West Developments, a company headed by a former Ansett executive. It was subsequently taken over by the Western Australia-based commuter airline Skywest Airlines in 1983.

Ansett's trunk airline operations have probably received some advantage from the feed provided by its regional operators. However, ownership linkages are not the only means by which the larger operators gain access to on-carriage passengers. Commuter and regional airlines have on-carriage arrangements with larger carriers which in turn provide services such as booking facilities and baggage handling for the small operators. For example, TAA has traditionally provided facilities for East-West .

Non-aviation activities

A number of companies involved in the airline industry have significant non-aviation interests. Non-airline activities accounted for 27.7 per cent of the Ansett group's revenue in 1982-83. TAA has also diversified its activities in recent years through its involvement in travel agencies, several resort islands and a recently announced hotel project in Melbourne. Details of non-aviation activities by the major companies are presented in Table 2.6.

TABLE 2.6-NON-AVIATION ACTIVITIES OF MAJOR AIRLINE GROUPS, 1984

Company	*Principle non-aviation activities*
Ansett Transport Industries	Road passenger and freight services Hotel and tourist resorts Insurance Furniture removals and storage Restaurants Manufacturing Travel agency
TAA	Tourist resorts Travel agency Car rental

Sources: Ansett Transport Industries (1984). Trans Australia Airlines (1984a).

Route networks

The domestic airlines are not restricted to the market sectors which comprise their core activities. The trunk airlines operate services on some regional routes such as those in western Queensland and regional carriers operate on some trunk routes[1]. In addition, the regional carrier Air Queensland operates some commuter services and the commuter airline Skywest is engaged in regional operations through its association with East-West.

Table 2.7 illustrates the importance of trunk and regional carriers on other routes[2]. The number of passengers carried by regional airlines on trunk routes has increased since 1976-77 with particularly rapid growth after 1980-81 as a result of increased trunk operations by East-West[3]. By 1983-84 regional airlines carried 6 per cent of trunk traffic. In contrast, the number of passengers carried by trunk airlines on regional routes declined steadily after 1977-78 as TAA and Ansett withdrew from routes which were unprofitable for them.

Information on the number of points served by the trunk and regional airlines in 1979 and 1984 is presented in Table 2.8. This indicates that the total number of towns and cities served by the two trunk airlines fell substantially over this period while the regional carriers' networks were generally constant or grew slightly. The Northern Territory operator and Air Queensland had substantial changes due respectively to the takeover of Connair and the issue of an airline licence.

Changes by the trunk airlines in recent years have included their withdrawal from many of the less dense markets which they previously

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1. The trunk route operations of the regional airlines involve prescribed routes (eg. Melbourne-Albury-Sydney) or specialised services where the type of service is not provided by TAA or Ansett (for example, low fare F27 services operated by East-West between Sydney and Canberra). In most cases, the regional airlines are subject to restrictions such as compulsory intermediate stops and the use of smaller and slower aircraft.
2. As a result of the data attribution problems mentioned earlier, these figures only provide approximate estimates of activities on other routes.
3. East-West accounted for 96 per cent of the increase in the number of passengers carried by regional airlines on trunk routes between 1981-82 and 1983-84. Its share of trunk traffic carried by regional airlines increased from 13 per cent to 49 per cent over this period. The other major regional operator was Ansett WA whose Perth-Darwin service accounted for 57 per cent of trunk traffic carried by regional airlines in 1981-82 and 30 per cent in 1983-84.

TABLE 2.7-PASSENGERS CARRIED BY AUSTRALIAN TRUNK AND REGIONAL AIRLINES ON OTHER ROUTES, 1974-75 TO 1983-84

	Trunk airlines on regional routes		*Regional airlines on trunk routes*	
Year	*Passengers ('000)*	*Per cent of regional traffic*	*Passengers ('000)*	*Per cent of trunk traffic*
1974-75	328	20	138	2
1975-76	291	19	132	2
1976-77	445	26	117	2
1977-78	475	26	134	2
1978-79	468	25	140	2
1979-80	306	18	192	2
1980-81	304	19	224	2
1981-82	248	17	339	3
1982-83	147	12	445	5
1983-84	97	8	591	6

Sources: Department of Aviation (Domestic Air Transport Statistics, various years). Department of Transport (Domestic Air Transport Statistics, various years).

TABLE 2.8-POINTS SERVED BY TRUNK AND REGIONAL AIRLINES, 1979 AND 1984

	Points served	
Airline	*1979*	*1984*
Ansett	35	27
TAA	51	36
Air NSW	20	23
Airlines of NA	23[a]	8
Airlines of SA	7	7
Ansett WA	16	16
Air Queensland	0[b]	15
East-West	21	25

a. Refers to Connair operation in 1979.
b. Air Queensland did not have an airline licence at this time.

Source: Department of Aviation (personal communication).

served with F27 aircraft. The trunk airlines have been replaced on these routes by regional and commuter operators[1].

Regional airlines have also withdrawn from some of their less dense routes. In addition, carriers such as East-West and Air Queensland have increased their involvement in the more dense regional routes and, in the case of East-West, expanded operations into parts of the trunk network.

The replacement of trunk and regional airlines by smaller operators has been associated with a significant increase in service frequency in some cases. For example, Ansett provided six return flights per week between Melbourne and Mildura prior to its withdrawal from this F27 service in April 1983 (Reid 1983, p10). By June 1984, Kendell Airlines and Murray Valley Airlines were operating a total of 34 return flights per week on this route (Reid 1984, p88).

There is significant variation in the number of carriers operating on individual routes. The majority of trunk routes are serviced by TAA and Ansett, but in some cases services are also provided by a regional or commuter airline. Many of the regional services are operated by a single carrier[2], although commuter airlines offer competing services on some routes such as Melbourne-Albury and a second carrier has been permitted to operate on some routes in Western Australia. In early 1984, two regional and two commuter airlines were providing services between Adelaide and Mount Gambier (Reid 1984, p88).

Market shares

Table 2.9 presents information on traffic carried by the individual trunk and regional airlines between 1979-80 and 1984-85. The number of passengers carried by the trunk airlines generally fell up to 1982-83 but recovered in the two subsequent years. The proportion of airline passengers carried by the trunk airlines fell from 86.4 per cent in 1979-80 to 82.4 per cent in 1984-85.

TAA and Ansett carried similar numbers of trunk airline passengers over the five years to 1983-84. There was some variation in market

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1. For example, Sunstate Airlines replaced TAA on the Brisbane/Maryborough/Bundaberg/Gladstone route in early 1983 and Kendell Airlines replaced Ansett on the Melbourne/Hamilton/Mount Gambier route. In both cases, the new operator used aircraft smaller than the F27s previously operated on these services.
2. In many cases, this results from the regulatory controls imposed by State governments.

shares, with TAA carrying over 50 per cent of passengers in three of the five years. However, the individual market shares of TAA and Ansett varied over a relatively narrow range up to 1983-84, from a low of 49.1 per cent to a high of 50.9 per cent. TAA's share is expected

TABLE 2.9-TRAFFIC CARRIED BY AUSTRALIAN AIRLINES, 1979-80 TO 1984-85
('000 passenger embarkations)

	Year					
Airlines	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*	*1984-85*[a]
Trunks						
Ansett	4 885	4 856	5 008	4 431	4 408	4 780
TAA	5 057	5 013	4 840	4 331	4 427	4 546
Total	9 942	9 869	9 848	8 762	8 835	9 326
Regionals						
Air NSW	444	421	413	361	379	426
Airlines of NA[b]	64	55	76	77	86	90
Airlines of SA	217	202	197	186	190	187
Ansett WA[c]	363	366	375	387	391	398
Air Queensland[d]	0	10	47	78	85	127
East-West	476	457	441	482	630	776
Total	1 563	1 512	1 549	1 571	1 761	2 004
Total[e]	11 505	11 381	11 397	10 333	10 596	11 330

a. Estimate based on provisional data for first three quarters and extrapolation for final quarter.
b. ANA figures refer to operator of services in Northern Territory. This involved Connair up to September 1980 and the East-West affiliate Northern Airlines from that date until February 1981. The Ansett affiliate Airlines of Northern Australia has operated these services since April 1981.
c. Formerly MacRobertson Miller Airline Services and Airlines of Western Australia.
d. Bush Pilots Airways until formally renamed Air Queensland in January 1982. Prior to receipt of its airline licence in December 1980, Air Queensland was an operator of commuter services only and hence there was no regional airline traffic carried in 1979-80.
e. Excludes commuter operators.

Note: Figures may not add to totals due to rounding.

Sources: Department of Aviation (1983a, 1984a and 1985c). Department of Transport (1981a and 1982a).

to fall to 48.9 per cent in 1984-85 but a strike by TAA engineers was probably a major reason for the reduction.

The four regional airlines controlled by Ansett Transport Industries (Operations) Pty Ltd carried approximately 10 per cent of total airline traffic in 1984-85. The number of passengers carried by Air New South Wales declined until 1982-83, but there was some recovery in traffic in the two subsequent years. Loadings on Airlines of Northern Australia and Ansett WA rose moderately. The fall in the number of passengers carried by Airlines of South Australia partly reflects competition from commuter airlines in South Australia's unregulated environment for intrastate aviation.

There was a substantial increase in the number of passengers carried by the remaining regional airlines. Air Queensland grew rapidly from a low base and is expected to carry 1.1 per cent of total airline passengers in 1984-85. Passengers on East-West services rose by 31 per cent in 1983-84 and are expected to increase by 23 per cent in 1984-85 as a result of increases in that airline's route network and service frequencies. The proportion of total airline passengers carried by East-West increased from 4.1 per cent in 1979-80 to 6.9 per cent in 1984-85.

There have also been significant changes in the commuter sector. The number of commuter operators fell from 56 in 1983 to 44 in 1984 as both established and newly formed carriers were taken over or ceased operations. This trend was associated with an increase in the market share held by the major operators. Table 2.10 indicates that in 1983-84 the 10 largest commuter operators carried 78.9 per cent of commuter traffic. The comparable figure for 1979-80 was 67.8 per cent. The three largest operators carried 37.5 per cent of commuter traffic in 1983-84.

Aircraft operated

The domestic airlines utilise a variety of jet and turbo-prop aircraft. The aircraft operated by the trunk and regional carriers in June 1984 are listed in Table 2.11.

An aircraft re-equipment programme, which commenced in 1981, will result in the replacement of most of the aircraft operated by the trunk and regional airlines over a period of six or seven years[1].

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1. Some of these purchases may have been encouraged, or at least expedited, by the Commonwealth Government's investment allowance.

TABLE 2.10-TRAFFIC CARRIED BY 10 LARGEST COMMUTER OPERATORS, 1983-84

Airline	*Passengers ('000)*	*Per cent of total commuter traffic*
Air Queensland[a]	146	15.4
East Coast	108	11.4
Aeropelican	102	10.7
Sunstate	80	8.4
Kendell	74	7.8
Skywest	72	7.6
Hazelton	53	5.6
Commodore	44	4.6
Murray Valley	36	3.8
Airlines of Tasmania	34	3.6
Other	200	21.1
Total	949	100.0

a. Excludes regional airline traffic.

Source: Department of Aviation (personal communication).

These changes involve capital expenditure of up to $3240 million[1]. The airlines have spent around $890 million on aircraft delivered since 1981 and have contracted to purchase additional aircraft at a cost of approximately $1780 million. Options currently held by Ansett could result in the expenditure of an additional $570 million.

Trunk airlines

The trunk airlines have changed much of their equipment in recent years.

Ansett commenced operation of the wide-body Boeing B767 in 1983. It also replaced its Douglas DC9s with Boeing B737-200s and introduced later models of the Boeing B727 as part of overall expenditure of more than $500 million on 21 new Boeing aircraft delivered from 1982.

In May 1985, it was announced that Ansett had ordered eight Airbus A320 aircraft at a cost of $550 million for delivery from 1989 and placed options on nine more (Harrington 1985b). Some of these 140-seat aircraft will reportedly be used on domestic routes such as

1. Net expenditure would be less than this figure due to the sale of older aircraft that are replaced.

TABLE 2.11-PASSENGER AIRCRAFT OPERATED BY TRUNK AND REGIONAL AIRLINES, JUNE 1984[a]

Seating/ operator	*Aircraft*								
	A300	*B767*	*B727*	*B737*	*DC9*	*F28*	*F27*	*S61*[b]	*Total*
Number of seats per aircraft	230	211	144	102	92	60-74	36-52	25	..
Operator									
TAA	3	..	14	..	9	..	3	..	29
Ansett	..	4	12	12	..	..	5	2	35
Air NSW	..	..	..	..	..	2	6	..	8
Airlines of NA[c]	..	..	..	..	..	..	..	..	..
Airlines of SA	..	..	..	..	..	..	4	..	4
Ansett WA	..	..	..	..	..	7	..	..	7
Air Queensland	..	..	..	..	..	..	3	..	3
East-West	..	..	..	..	..	2	7	..	9
Total	3	4	26	12	9	11	28	2	95

a. Excludes aircraft leased to overseas operators. Indicates aircraft operated rather than ownership.
b. Helicopter.
c. ANA aircraft are transferred on a user requirement basis from Ansett (B737, F27) and Ansett WA (F28).

.. not applicable

Source: Department of Aviation (1984c, p139).

Melbourne-Perth and the rest will be leased out to other airlines. The latter development represents a significant diversification of Ansett's activities into a proposed world-wide aviation support venture involving aircraft leasing, purchasing, maintenance, training and management. A $500 million order for 12 B737-300s reported in June 1985 will result in the replacement of the existing B737-200s.

TAA received the first of five wide-body Airbus A300s in 1981. In May 1985, it announced a decision (subject to Government approval) to buy 12 Boeing B737-300 aircraft at a cost of $500 million to replace its DC9s from mid 1986 (Trans Australia Airlines 1985). TAA is also considering the purchase of A320 aircraft to replace its B727s.

The purchase of new equipment in the early 1980s, particularly wide-body aircraft, was predicated on a continuation of high traffic growth

rates. However, the downturn in trunk airline traffic after 1979-80 resulted in the emergence of significant excess capacity. The two trunk airlines responded by delaying the delivery of some new aircraft and leasing equipment to overseas operators. TAA currently has one A300 on lease to Air Niugini[1]. Ansett has also leased aircraft to other carriers (Harrington 1985b).

The withdrawal of the trunk airlines from less dense routes has resulted in the sale or leasing to other operators of 11 F27 aircraft since 1981. TAA's three remaining F27s are now restricted to services in western Queensland while Ansett's five aircraft are used on routes between Melbourne and Tasmania. Another three Ansett F27s are leased to Air Queensland.

Regional airlines

There have also been changes in the aircraft operated by the regional carriers.

The re-equipment program at Ansett's trunk airline has been paralleled by changes at the company's regional operating divisions. Ansett WA replaced several of its F28-1000 aircraft with the larger F28-4000 model from June 1983. In May 1984, it ordered two BAe 146 aircraft at a cost of $40 million and placed options on six more.

In early 1985, Ansett announced that it had placed firm orders for 15 Fokker F50 aircraft costing $180 million to be delivered from early 1987 (*Australian Financial Review*, 15 March 1985). These 50-seat aircraft will replace the F27s operated by Ansett and its regional operating divisions and may also be leased to other operators.

East-West introduced the first of four F28-4000 aircraft in May 1983. In March 1985 it announced that it wished to buy a B737-200 and a fifth F28-4000 at a cost of $50 million (Metcalfe and Earl 1985). Government approval for the importation of the aircraft has not been confirmed.

Air Queensland increased its F27 fleet from one aircraft in 1981 to three in 1984 as it placed greater emphasis on the higher density regional routes. In April 1985 it ordered four 42-seat ATR 42 aircraft at a cost of $50 million to replace its F27 and DC3 equipment

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1. Table 2.11 indicates that TAA operated three A300s on domestic services in June 1984. At that stage, the remaining two aircraft were leased to Lufthansa.

(*Asian Aviation* April 1985, p16). Deliveries are scheduled to begin in April 1986 and options are also held on three additional aircraft.

Commuter operators

The commuter airlines operate a wide variety of aircraft, ranging from 6 to 10 seaters such as the Piper PA 31 to larger equipment such as the Twin Otter. Approximately 65 per cent of the aircraft have nine seats or less (Reid 1984, p84).

The economics of small aircraft operation were adversely affected by revised operational standards which came into effect on 1 July 1983. These changes reduced the threshold for two pilot operation from 19 to 10 passengers (Stackhouse 1984, p104). This development, together with the withdrawal of trunk and regional airlines from their lower density routes, appears to have encouraged several commuter airlines to introduce larger aircraft[1]. For example, Sunstate Airlines and Murray Valley Airlines operate 36-seat Shorts 360 aircraft and Kendell Airlines has acquired two 30-seat Saab-Fairchild 340s.

Charter operators

The restrictions placed on charter operators have generally limited them to smaller aircraft. A major exception is Lloyd Aviation which took delivery of an 80-seat F28-4000 in June 1985 (*Australian Financial Review*, 11 April 1985).

Labour

Employment

By 1983, the domestic airlines employed approximately 17 000 people. This was the lowest number of employees in the industry over the period from 1974 to 1983 and was 1800 less than the peak level reached in 1981.

Information on employment at the domestic airlines over the 10 years to 1983 is presented in Table 2.12. The number of employees at Ansett showed no strong trend up to 1981 but then fell by more than 1000 or 13 per cent between 1981 and 1983. Employment at TAA generally increased until 1981 but fell by almost 800 or 9 per cent over the next two years. Both trunk airlines adopted a policy of reducing staff in line with falls in traffic between 1981 and 1983.

Employment at Air New South Wales, Airlines of South Australia and

1. The Commonwealth Government's investment allowance has also reportedly encouraged significant investment in commuter aircraft.

TABLE 2.12-EMPLOYMENT BY DOMESTIC AIRLINES, 1974 TO 1983

(number of employees)

	Airline								
Year	*Ansett*	*TAA*	*Air NSW*	*ANA*[a]	*ASA*	*AWA*	*Air Queens-land*	*East-West*	*Total*
1974	8 261	7 868	281	172	128	516	-	456	17 682
1975	8 396	8 005	292	164	141	511	-	458	17 967
1976	8 140	7 818	278	129	140	492	-	432	17 429
1977	8 272	8 111	264	135	144	509	-	467	17 902
1978	8 528	8 203	275	154	141	516	-	509	18 326
1979	8 581	8 256	266	157	125	524	-	517	18 269
1980	8 124	8 620	288	na	124	540	-	531	18 227
1981	8 419	8 620	296	na	130	536	275	552	18 828
1982	8 169	8 377	287	25	132	530	340	580	18 440
1983	7 350	7 825	269	24	127	506	308	630	17 039

a. Formerly Connair and Northern Airlines.

na not available

Sources: Statistics published by International Civil Aviation Organisation. Air Queensland (1983).

Ansett WA remained roughly constant over the 10 years to 1983. There was a steady increase in employee numbers at East-West as it expanded its operations. Employment at Air Queensland rose and then fell during the short period after it obtained an airline licence.

Industrial relations

Several trade unions cover employees in the domestic air transport sector. Aircraft crew on domestic services are covered by the Australian Federation of Air Pilots, the Australian Airline Flight Engineers Association and the Australian Flight Attendants Association. Many airport and airline staff are members of the Transport Workers Union or the Federated Clerks Union.

The industrial relations record of the airline industry has periodically attracted public attention. Information on working days lost in the air transport sector and the Australian economy as a result of industrial disputes between 1974-75 and 1983-84 is presented in Table 2.13. The number of days lost in the air transport sector fell by more than 97 per cent in 1981-82. Although the figure subsequently increased, it was still well below the level of industrial disputation between 1975-76 and 1980-81.

TABLE 2.13-WORKING DAYS LOST IN AIR TRANSPORT SECTOR AND AUSTRALIAN INDUSTRY DUE TO INDUSTRIAL DISPUTES, 1974-75 TO 1983-84

	Air transport[a]		*Australia*	
Year	*Days lost ('000)*	*Days lost per '000 employees*	*Days lost ('000)*	*Days lost per '000 employees*
1974-75	6	147	3 510	600
1975-76	28	778	3 799	635
1976-77	27	818	1 655	275
1977-78	24	618	2 131	355
1978-79	77	2 078	3 964	656
1979-80	19	528	3 320	532
1980-81	72	1 970	4 192	657
1981-82	2	40	2 158	337
1982-83	4	86	1 641	262
1983-84	7	164	1 306	201

a. Includes disputes affecting international operations.

Sources: Australian Bureau of Statistics (1978, 1981, 1984a, 1984b 1985 and personal communication).

The number of days lost per employee in the air transport sector was greater than the figure for the economy as a whole for five of the 10 years between 1974-75 and 1983-84. Over the four years up to 1978-79 and in 1980-81 the number of days lost per employee in air transport was between 1.2 and 3.2 times the national average. The flight engineers dispute at TAA in December 1984 may result in a significant deterioration in that airline's performance in 1984-85.

INTER-MODAL COMPETITION

Air transport services compete against buses, trains, shipping and private motor vehicles in the carriage of passengers. Developments in other modes can therefore have significant effects on air services. Table 2.14 provides data on various characteristics of public transport operations on a sample of routes in June 1984.

Travel time is lowest by air in all cases and the time advantages of air transport generally increase with route distance. On the shortest routes the time penalties associated with other modes may not be substantial when travel times between airports and ultimate origins and destinations are taken into account.

Air transport provides the highest service frequency on all routes surveyed although in several cases the performance of bus services is similar. Rail and sea operations have much lower service frequencies.

In assessing the level of fares on the various modes, it is appropriate to consider both the lowest economy fare with no restrictions and the lowest available fare. In all sample markets covered in Table 2.14 air transport has the highest unrestricted economy fare while buses generally offer the lowest fare.

The rankings for the lowest available return fare are slightly different. Air transport offers the second lowest fare in one market, but it is still the highest in all other cases. The nature and extent of restrictions may vary significantly between modes and the fare data do not provide any information on the availability of, or restrictions on the lowest fares.

SUMMARY

The system of air transport regulation in Australia has been a major determinant of the industry's present structure. The primary feature of the economic regulation of interstate services is the two airline

TABLE 2.14-INTER-MODAL COMPETITION ON SELECTED ROUTES, JUNE 1984

Characteristic	*Route*					
	Sydney-Perth	*Brisbane-Cairns*	*Sydney-Brisbane*	*Sydney-Melbourne*	*Melbourne-Devonport*	*Sydney-Canberra*
Distance (kms)						
Air	3 284	1 392	747	707	412	237
Bus	4 320	1 950	1 020	1 040	ns	300
Rail	3 961	1 678	987	960	ns	326
Sea	ns	ns	ns	ns	443	ns
Travel time (hours)[a]						
Air	4.6	2.8	1.3	1.2	1.3	0.6
Bus	60.0	27.5	15.5	13.0	ns	4.3
Rail	67.0	37.0	16.0	13.0	ns	4.5
Sea	ns	ns	ns	ns	12.5	ns
Services per week[b]						
Air	29	89	272	306	120	110
Bus	28	28	252	196	ns	28
Rail	6	12	14	40	ns	38
Sea	ns	ns	ns	ns	6	ns

TABLE 2.14 (Cont)-INTER-MODAL COMPETITION ON SELECTED ROUTES, JUNE 1984

Characteristic	*Route*					
	Sydney-Perth	*Brisbane-Cairns*	*Sydney-Brisbane*	*Sydney-Melbourne*	*Melbourne-Devonport*	*Sydney-Canberra*
Lowest unrestricted return economy fare ($)						
Air	731	435	291	282	187	160
Bus	280	150	74	74	ns	50
Rail	697	151	112	112	ns	38
Sea	ns	ns	ns	ns	126	ns
Lowest available return fare ($)[c]						
Air	402	241	160	155	123	88
Bus	170	118	48	48	ns	50
Rail	697	151	112	112	ns	38
Sea	ns	ns	ns	ns	112	ns

a. Average one-way travel time.
b. Both directions.
c. Refers to fares available all year round. Excludes off-peak discounts and concessions for groups such as pensioners and students. Restrictions and service quality vary between modes and routes.

ns no scheduled service

Source: Carrier timetables and fare schedules.

policy which is supported by five major pieces of legislation. Several State governments also regulate intrastate services.

The general upward trend in domestic airline traffic since World War II was interrupted after 1979-80 when passenger numbers declined substantially as a result of the economic recession. However, growth resumed in 1983-84. Growth rates have varied significantly on different routes over the last five years.

The number of passengers carried on commuter routes has grown rapidly over the last 10 years while trunk traffic has risen moderately and traffic on regional routes has declined. The growth rate in the commuter sector may be slower over the next few years as the larger carriers have already withdrawn from many of their unprofitable routes.

Ownership of the trunk and regional airlines is now heavily concentrated and there is limited potential for further concentration of ownership structures. Both Ansett and TAA have significant non-aviation interests. Commuter services are operated by a relatively large number of carriers, but the 10 largest operators handle most of the traffic. There appears to be some scope for additional mergers or takeovers in the commuter sector.

The regional airlines have increased their share of trunk route traffic from 2 per cent to 6 per cent over the last 10 years. Further expansion of these operations is likely if the present regulatory framework is maintained. The trunk airlines have substantially reduced their operations on regional routes and there may be some scope for further reductions.

The market shares of TAA and Ansett have generally varied over a narrow range in recent years and this would be expected to continue under the current two airline policy. The proportion of total airline passengers carried by the trunk airlines has fallen slightly over the last five years. East-West and Air Queensland have been the principal sources of growth in regional carrier operations.

The aircraft delivered to the airlines since 1981 and those currently on order or under option involve total expenditure of $3240 million. This re-equipment program will result in the replacement of almost all of the aircraft operated by trunk and regional airlines over a period of six or seven years. The move by commuter operators to introduce larger aircraft may continue for some time in the current regulatory environment.

The industrial relations record of the airline industry was worse than the performance of the total Australian workforce in five of the 10 years up to 1983-84. The number of days lost due to industrial disputes in the air transport sector fell substantially after 1980-81.

Analysis of inter-modal competition on selected routes indicates several general characteristics of air transport. It provides the fastest travel time and highest service frequency but fares are generally higher than those on competing modes.

CHAPTER 3-PERFORMANCE OF AUSTRALIAN AIRLINES

The purpose of this chapter is to measure the economic and operational performance of the Australian domestic trunk airlines. A number of performance indicators can be used to make such an assessment (see for example Mackay 1979). However, in this chapter, performance is measured using the four criteria identified in Chapter 1 as representing the public interest in domestic aviation:

- safety
- allocative efficiency
- technical efficiency
- equity.

In the first part of the chapter, an assessment is made of the safety record of Australian aviation. Allocative efficiency is then assessed in terms of the level and range of fares and fare setting procedures. A comparison is also drawn between the level of domestic air fares in Australia and the US and questions of factor rents and airline profitability are examined.

The analysis of allocative efficiency is followed by an assessment of technical efficiency. Australian trunk airline costs are examined and issues of aircraft utilisation, load factors and labour productivity are considered. The cost structures of both domestic airlines are also compared with similar airlines operating in the US.

The incidence of direct government subsidisation and cross-subsidisation of air services is then addressed in order to assess the equity implications of the current air fare structure.

SAFETY

There is evidence that the safety performance of the Australian airline operators compares very favourably with that of overseas airlines.

Ramsden (1985) compared the air fatality rates in a number of countries including Australia. This comparison is presented in Table 3.1.

Between 1973 and 1984 there were 0.656 fatalities per million flights in Australia. The two fatalities arose from a single accident in 1975. The Australian fatality rate is substantially lower than that of the other countries examined. Information for earlier years indicates that Australian airlines would have been similarly ranked.

These statistics do not include fatalities arising from general aviation and commuter airline accidents of which there have been a number in Australia in recent years. Between 1978 and 1982 the general

TABLE 3.1-AIRLINE SAFETY IN SELECTED COUNTRIES, 1973-1984[a]

Country	*Number of flights (million)*	*Number of accidents involving fatalities*	*Fatalities*	*Fatalities per million flights*
Argentina	1.145	4	87	75.982
Australia	3.047	1	2	0.656
Belgium	0.516	1	105	203.488
Brazil	2.758	12	409	148.295
Canada	4.817	14	118	24.497
Colombia	1.238	34	631	509.693
Egypt	0.298	4	108	362.416
France	3.247	4	7	2.156
West Germany	2.311	3	63	27.261
India	1.270	7	424	333.858
Italy	2.257	4	258	114.311
Japan	4.675	3	62	13.262
Netherlands	1.189	3	456	383.515
Scandinavia	4.396	2	37	8.417
Turkey	0.403	7	692	1 717.121
United Kingdom	6.254	8	355	56.763
United States	60.203	71	2 203	36.593
Venezuela	1.225	5	198	161.632

a. Statistics include fatalities from scheduled or non-scheduled revenue passenger or cargo flights for aircraft of 30 seats or larger capacity.

Source: Ramsden (1985, p30).

aviation fatality rate per annum varied between 1.78 and 1.60 fatalities per 100 000 flying hours.

It is not evident that industry structure has any significant effect on safety, or that safety will deteriorate in less regulated environments. This is supported by evidence from the US, presented in Table 3.2, which shows that fatality rates have not increased in the deregulated environment since 1978.

TABLE 3.2-ACCIDENT RATE ON SCHEDULED SERVICES OF US AIRLINES, 1974 TO 1983

Year	*Fatal accidents*	*Fatal accidents per 100 000 departures*
1974	7	0.127
1975	2	0.043
1976	2	0.041
1977	3	0.061
1978	5	0.100
1979	4	0.074
1980	0	0.000
1981	4	0.077
1982	5	0.081
1983[a]	3	0.061

a. Preliminary.

Source: Aviation Daily (30 July 1984).

ALLOCATIVE EFFICIENCY

It was noted in Chapter 1 that allocative efficiency is achieved when price and output levels reflect consumer preferences relative to the distribution of income. These conditions will only be met if fares accurately reflect costs and a range of different fare types are available.

Current air fare structure

The current air fare structure is comprised of nine elements:

- first class fares
- business class fares

- economy class fares
- advance purchase fares
- excursion fares
- standby fares
- group travel fares
- concession fares
- holiday/tourist fares.

The discounts offered and the conditions attached to the purchase of these fares are summarised in Table 3.3. Further information is provided in Table IV.1 in Appendix IV.

Under current fare determination procedures Ansett and TAA are obliged to offer the same economy and first class fares, but are free to offer

TABLE 3.3-STRUCTURE OF TRUNK AIRLINE FARES

Fare type	*Premium or discount on economy fare*	*Booking and travelling requirements*
First class	50 per cent above	Nil
Business class	15 per cent above	Nil
Economy class	Nil	Nil
APEX	35 per cent below	Advance purchase and minimum stay requirements
Excursion	45 per cent below	Advance purchase and minimum stay requirements
Standby	20 per cent below	No reservation requirement
Group travel	10 to 15 per cent below	Minimum size group flying on forward and return journeys
Concession	10 to 50 per cent below	Specific age requirements
Holiday/ tourist	Average of 30 per cent below	Advance purchase, minimum stay and minimum travel requirements

Source: Ansett Airlines of Australia (1984b). East-West Airlines (1984). Trans Australia Airlines (1984d).

a variety of discount fares subject to IAFC approval. In practice, both airlines generally offer identical discount fares although TAA is the only domestic airline offering a business class travel option to passengers.

The range of fares offered by the airlines reflects a number of different service dimensions. First, business and economy class fares are differentiated on the basis of in-flight service and have no booking or travelling restrictions. Conversely, advance purchase, excursion and standby fares are subject to restrictive booking and/or travelling conditions. The availability of standby fares is affected by the availability of unutilised capacity, while discounts offered on advance purchase and excursion fares are a reflection of an individual's willingness to purchase fares in advance of departure. Group travel, concession and tourist discount fares reflect different passenger characteristics and booking arrangements.

The current fare structure therefore provides a number of alternatives to passengers and serves to satisfy consumer preferences in several ways. In addition, information in Appendix IV indicates that the range of discount fares has increased since 1978. All current discount fares were introduced between 1978 and 1984 and significant revisions to discount rates were made during this period. However, the range of fares alone is not indicative of the level of allocative efficiency.

Allocative efficiency will be maximised when fares and service quality accurately reflect consumer preferences. While the availability of discount fares may be indicative of the airlines attempting to satisfy consumer preferences, it is possible that demand exists for fare/service combinations which are not currently supplied.

One example of this is the non-availability of low quality economy fares such as are offered in the US by People Express. This fare is similar to the Australian economy fare in that passengers are not required to satisfy specific booking conditions or travelling requirements. However, the quality of service offered is lower than that of the equivalent Australian economy fare. Some overseas airlines also offer holiday charter and shuttle services which are not currently offered by the Australian airlines.

The restrictions placed on the availability of discount fares may also contribute to allocative inefficiency. Consumer preferences may be satisfied by the range of fare/service quality options, but

restrictions such as seat availability may effectively restrict choice between these options. For example, passengers may only wish to purchase discount fares but because of the restricted number of discount seats may be forced into purchasing economy fares or not travelling by air at all.

All discount fares offered by the domestic airlines are subject to approval by the Independent Air Fares Committee (IAFC). Before approving a request for a discount fare the IAFC must be satisfied that the proposed discount fare:

- is likely to improve the profitability of the operations of the airline;
- is unlikely to result in economy fares of trunk route operators being increased; and
- that the proposed conditions are reasonable and applied without discrimination.

These criteria may restrict the range and types of fares offered to passengers and therefore can contribute to allocative inefficiency.

Allocative inefficiency will also arise when fares do not accurately reflect the costs of providing different services. In the case of fares related to in-flight service (first, business and economy class fares) fares may accurately reflect costs. In other cases a disparity between fares and costs may exist. For example, fares which are related to passenger characteristics and trip purpose may be considered to be discriminatory because they relate to demand elasticities. However, this may not be in conflict with efficiency considerations. Where marginal cost pricing does not recover costs, discriminatory pricing will permit cost recovery with minimim efficiency losses (Baumol and Bradford 1970). A clear case of allocative inefficiency may, however, exist when such pricing techniques are used to earn excess profits.

Allocative inefficiency may also exist when the fares on some routes are set below marginal cost levels. In this situation cross-subsidisation is said to occur between services and efficiency losses will result. Hence, fare relativities and fare determination are important concerns. These matters are dealt with in greater detail when equity issues are examined later in this chapter.

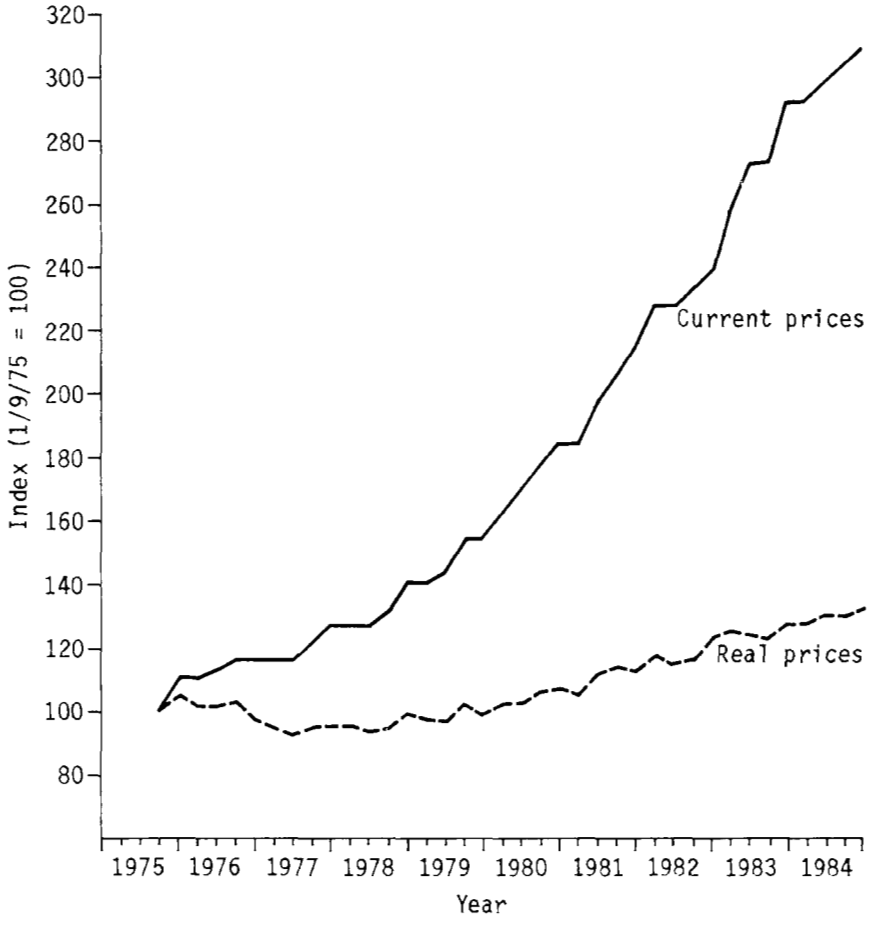
Trends in air fares

The level of fares is also an important aspect of allocative

efficiency. Figure 3.1 provides information on the trend in average economy air fares for TAA and Ansett between 1975 and 1984, in both real and nominal terms.

Between the September quarter of 1975 and the December quarter of 1984 economy fares of TAA and Ansett rose by approximately 30 per cent in real terms. This represents an annual average increase of approximately 2.5 per cent.

Underlying the changes in fares have been corresponding changes in the air fare determination formula. These changes are summarised in Table IV.2 in Appendix IV. Since 1974 three major modifications to the formula have been made.



Source: Annual Reports of the DofA, DoT and the IAFC.

Figure 3.1-Economy air fare index for TAA and Ansett, 1975-84

In January 1980 a two tier distance rate was introduced for fare calculations on the following routes:

- Melbourne-Perth
- Sydney-Perth
- Adelaide-Darwin
- Brisbane-Darwin.

This replaced a single rate which previously applied to all routes. The second distance rate was 15 per cent below the primary distance rate and applied for distances beyond 2200 kilometres. This change had the effect of reducing the air fare levels for longer routes and was designed to reflect the lower costs of operating services on those routes.

The relative weightings given to the flag-fall and distance-related components of the formula were altered following the recommendations of the *Report of the Independent Public Inquiry into Domestic Air Fares* (Holcroft Report). Flag-fall charges were increased by approximately 84 per cent while distance-related charges fell by about 13 per cent from previous levels. Overall, air fares increased by 7.4 per cent although fares on short-haul routes rose considerably more than this while fares on long-haul routes declined.

The final major change to the air fare formula was made in August 1982 following the recommendations of the first IAFC cost allocation review. The basic structure of the formula was changed to a third degree polynomial of the form:

$$a + bx + cx^2 + dx^3$$

where a is the flag-fall component and bx, cx^2 and dx^3 form the distance component of the formula.

Further information on changes to the air fare formula is presented in Appendix IV.

Revenue yields

The trend in the availabiity (or use) of air fares can be examined on the basis of trends in the level of dilution. The level of dilution is defined here as the difference between the average yield if all passengers purchased economy class fares and the actual yield. This difference reflects the purchase of discount and premium fares on the part of some passengers. A better estimate of the dilution

attributable to discount fares alone would be possible if first class and business class revenue were excluded from the calculation. However, insufficient data on the number of business class passengers were available to make this calculation.

Estimates of the level of dilution for TAA and Ansett between 1981-82 and 1983-84 were derived from information on average passenger trip length, average economy air fares and average revenue per passenger. These estimates are presented in Table 3.4.

TABLE 3.4-ESTIMATES OF REVENUE DILUTION, 1981-82 TO 1983-84

(per cent)

Airline	*1981-82*	*1982-83*	*1983-84*
TAA	21.9	24.3	25.9
Ansett	7.2	11.3	14.9

Source: BTE estimate.

These data indicate that the level of dilution for both airlines has increased over the three years to 1983-84. This increase is prominent in the Ansett data which show that dilution has doubled over this period. The other significant feature of the data is the comparatively high dilution levels for TAA compared with Ansett. This suggests that TAA carried a greater number of discount fare passengers than did Ansett over this period. However, this should not be interpreted as an indication that the range of fares offered by TAA more closely matched consumer preferences than those offered by Ansett. It is possible that more of Ansett's passengers may have preferred to travel using higher yielding fares than passengers carried by TAA. Unless it can be shown that unfulfilled demand exists for discount fares offered by Ansett no conclusion concerning allocative efficiency can be drawn.

Air fare determination

Since 1974 domestic air fares have been determined on the basis of a national formula which is comprised of flag-fall and distance components. The basic structure of the formula has been a subject of examination by the IAFC since its inception. The role of the IAFC in undertaking cost allocation reviews, and the relationship of cost allocation reviews to the fare formula and fare determination, are described in Appendix V.

The major criticism that can be made of the current approach to air fare determination as required by the *Independent Air Fares Committee Act 1981* is that fares are determined solely on the basis of airline operating costs. This approach is deficient when economic efficiency is a major issue. In order to maximise economic efficiency prices should reflect demand. Costs should only determine the limits to price; the lower limit to price is determined by marginal cost while the upper limit is determined by the cost of alternative supply. Price levels between these limits depend on demand factors.

The costs associated with the operation of air services will vary with a number of factors, including:

- aircraft type
- load factors
- stage length and route density
- scheduling
- the relative efficiency and congestion of different airports.

The degree to which such factors are reflected in air fares is dependent upon the comprehensiveness of the formula on which fares are based. The current structure of flag-fall and distance components implemented by the IAFC does not reflect all these possible cost factors. The effect of the formula is that air fares will only reflect average costs rather than marginal costs. The costs associated with specific services will not be reflected in the fares for those services, but are recovered in the fares for all services.

Basing air fares on average cost will result in some loss in economic efficiency as average passenger costs will differ significantly from marginal costs in some cases. This issue is discussed in greater detail later in this chapter.

Similar arguments apply to the allocation of residual costs. The IAFC in past cost allocation reviews has allocated these costs on a 'block-flying' hour basis. However, if efficiency losses are to be minimised in achieving specific cost recovery targets, account must be taken of demand elasticities. Elasticities could be expected to vary with:

- stage length
- fare type
- travel purpose
- time of travel.

Only stage length is explicitly accounted for within the current formula structure and hence it is likely that the fares calculated using the formula will lead to economic efficiency losses.

The application of a nationally consistent formula may satisfy one aspect of equity requirements as passengers travelling similar distances will be charged similar fares. In addition, it will also enable all costs to be recovered. However, both equity and cost recovery under these circumstances will be achieved at the expense of some loss of economic efficiency.

Another criticism of the present fare determination process concerns the nature of the cost information used by the IAFC in cost allocation reviews. First, it would seem that information provided by the airlines is the main source of data. Minimal independent advice on costs is taken although the IAFC is not obliged to only use airline cost data. However, constraints are placed on the IAFC by the absence of satisfactory alternative sources of information. As a consequence, the veracity of the IAFC's cost calculations is highly dependent upon the accuracy of the information provided by the airlines. Furthermore, if cost information from both airlines is considered in determining fare levels, distortions may be introduced as any averaging of costs will not truly reflect the relative cost advantages that one airline may enjoy over another. Although the IAFC claims that its methodology is not a cost plus approach, it has in fact very similar features.

The second concern is the IAFC's use of historic cost data. This is justified on two grounds:

- historic costs bear a close relationship to the actual cost of providing services; and
- a general commercial and statutory acceptance of current cost accounting does not exist and therefore it would be inappropriate to set air fares on this basis.

From an economic point of view the use of historic cost data is regarded as being of little use for management decisions concerning cost recovery and pricing. Ideally, opportunity costs should be used to determine the value of assets, although in practice this may not be possible because of the lack of suitable cost information. Alternative methods to derive opportunity costs proposed in BTE (1984) account for some of these practical evaluation problems. Essentially these methods involve the use of current market values for assets or

the use of replacement values as a second-best approximation[1].

Comparison of domestic air fares

The level of fares alone does not provide an accurate indicator of allocative efficiency. It is also useful to consider how the level of fares compares with fares for similar services overseas.

Fare comparison constraints

The level of Australian domestic fares compared with those in overseas countries was examined by comparing fares in Australia and the US.

There are a number of difficulties in drawing such a comparison. First, the inherent difficulty in making comparisons due to fluctuating exchange rates is of considerable significance. For example, exchange rate movements in early 1985 have resulted in a fall of 25 per cent in the value of the Australian dollar compared with the US dollar. In addition, it is unlikely that there has been sufficient time for the impact of these exchange rate movements to work their way through to costs and air fares.

Second, the complexity and range of air fares in the US make the choice of an indicative fare, or the calculation of a representative average fare, extremely difficult. While the most common approach has been to select economy fares for journeys of similar distance, the proportion of passengers in the US travelling on standard coach fares (the US equivalent to economy fares) has fallen from 60 per cent in 1977 to below 25 per cent in 1982 (Graham and Kaplan 1982, p72). It is debatable, therefore, whether economy air fares provide the most useful basis for comparison, either at the system level or for any sample of routes and distances.

Thirdly, any sample of routes may introduce bias as distance is only one of the determining factors for air fares in the US. Demand for air travel over any route is a reflection of a number of different influences and consequently the price/quality combination on routes of similar distance would be expected to vary in a competitive environment. Traffic density also affects operating costs when measured in terms of passenger-kilometres.

Finally, there may also be difficulties in interpreting data because the level of air fares in Australia and the US can reflect both

1. The IAFC has recently issued a discussion paper addressing the question of appropriate asset valuation procedures.

different demand and supply conditions. For example, some of the supply side reasons explaining any identifiable differences may include basic operating conditions such as curfews and weather, different safety regulations, and other institutional arrangements. Fundamental differences in the cost of factor inputs such as labour may also exist in the countries being compared.

Despite all the problems identified above it remains useful to compare the level of air fares in Australia with that in the US, since any significant differences in fare levels do point to the need for further research to determine the underlying causes. Two commonly used approaches involve comparisons of overall revenue yields and fares on selected routes.

Comparison of airline yields

Comparison of the average fare or yield allows for the effect of discounting and gives a broad guide to the level of fares at the airline or industry level. In addition, as yields reflect total revenue from all passengers, no bias is introduced in the selection of fare types or routes.

Table 3.5 provides a comparison of the average yields for the Australian domestic trunk airlines and US scheduled passenger services in general for 1983-84. These data indicate that the average yields of TAA and Ansett were above the US total industry and sub-system averages.

TAA's average yield, the lower of the two domestic airlines, is 45 per cent above the total US industry average of 8.50 cents per revenue passenger-kilometre. Similarly, TAA's average yield is approximately 40 per cent above the total national, short-haul national and US major sub-system averages.

Table 3.6 presents further information on the yield variation among the Australian and US airlines by providing a detailed comparison of the US national short-haul group and TAA and Ansett. The national group of airlines consists of carriers with operating revenues between US$100 million and US$1000 million, and the short-haul sub-group excludes all-cargo airlines, airlines operating in Hawaii and Alaska, and three operators engaged on long-haul routes.

Of the nine airlines included in the analysis, three are former local service carriers (Frontier, Ozark and Piedmont), three are former large intrastate carriers (Air Cal, Pacific Southwest and Southwest)

TABLE 3.5-US AIRLINE INDUSTRY AND AUSTRALIAN DOMESTIC TRUNK AIRLINE YIELDS, 1983-84

Category	*Yield*[a] *(cents per revenue passenger-kilometre)*	*Revenue passenger-kilometre (million)*
Australia domestic trunk airlines[b]		
Total	13.15	8 545
TAA	12.26	4 267
Ansett	14.05	4 279
US total certificated industry (scheduled services)	8.50	463 632
US majors (*J* US$1000m operating revenue per annum)		
Total	8.49	388 848
International	6.82	86 847
Domestic	8.97	301 984
US nationals (US$100-$1000m operating revenue per annum)		
Total	8.71	63 365
Short-haul	9.01	49 306
Long-haul	4.68	8 936
Alaskan/Hawaiian	12.56	4 992
US regionals (US$10-$100m operating revenue per annum)	7.85	10 209

a. Yields are in Australian currency and were calculated using an exchange rate of $A1.00 = US$0.905. The rate varied over the year from US$0.8613 to US$0.9429 and for December was US$0.9020.
b. TAA figure is passenger revenue divided by revenue passenger kilometres and Ansett figure is revenue from passenger trunk services divided by revenue passenger kilometres.

Sources: CAB (1984). Ansett Airlines of Australia (1984a). Department of Aviation (1985c). Trans Australia Airlines (1984c).

and three are newly established airlines (Midway, New York Air and People Express)[1].

These airlines have many similarities to TAA and Ansett. On average, they are of similar size, operate almost entirely domestic services over similar route stage lengths and operate similar aircraft. However, within the national group there are wide variations in these features.

All but one of the national short-haul airlines have a lower yield than Ansett or TAA. Furthermore, each of the US airlines with

TABLE 3.6-YIELDS FOR AUSTRALIAN DOMESTIC AIRLINES AND US NATIONALS SHORT-HAUL GROUP, 1983-84

Airline	*Yield[a] (cents per revenue passenger-km)*	*Revenue passenger km (millions)*	*Passenger revenue[a] ($A million)*	*Operating revenue[a] ($A million)*
Ansett	14.05	4 279	601	na
New York Air[b]	13.77	1 235	170	172
TAA	12.26	4 267	523	623
Midway[b]	12.26	1 109	136	139
Air Cal	11.68	2 304	269	302
Piedmont	11.47	9 266	1 063	1 123
Ozark	10.92	4 238	463	510
Pacific Southwest	10.02	5 012	502	531
Frontier	9.26	6 633	614	669
Southwest	7.68	7 030	540	557
People Express	5.15	8 545	440	464

a. Exchange rate used was $A1.00 = US$0.905 to convert US figures to Australian currency.
b. Reclassified by CAB from regional to national effective 1 January 1984.

na not available

Sources: CAB (1984). Ansett Airlines of Australia (1984a). Department of Aviation (1985c). Trans Australia Airlines (1984c).

1. Air Florida and Braniff are also classified as short-haul nationals, but insufficient data were available for them to be included in the analysis.

operating revenues similar to those of the Australian domestic carriers ($400 to $600 million) also has a lower yield.

The yield comparisons show that the overall level of fares in the US was significantly lower than that in Australia in 1983-84. This is a reflection of greater discounting activity and perhaps lower economy fare levels in the US. Information on the yields of the US airlines of similar size to Ansett and TAA reinforces this conclusion.

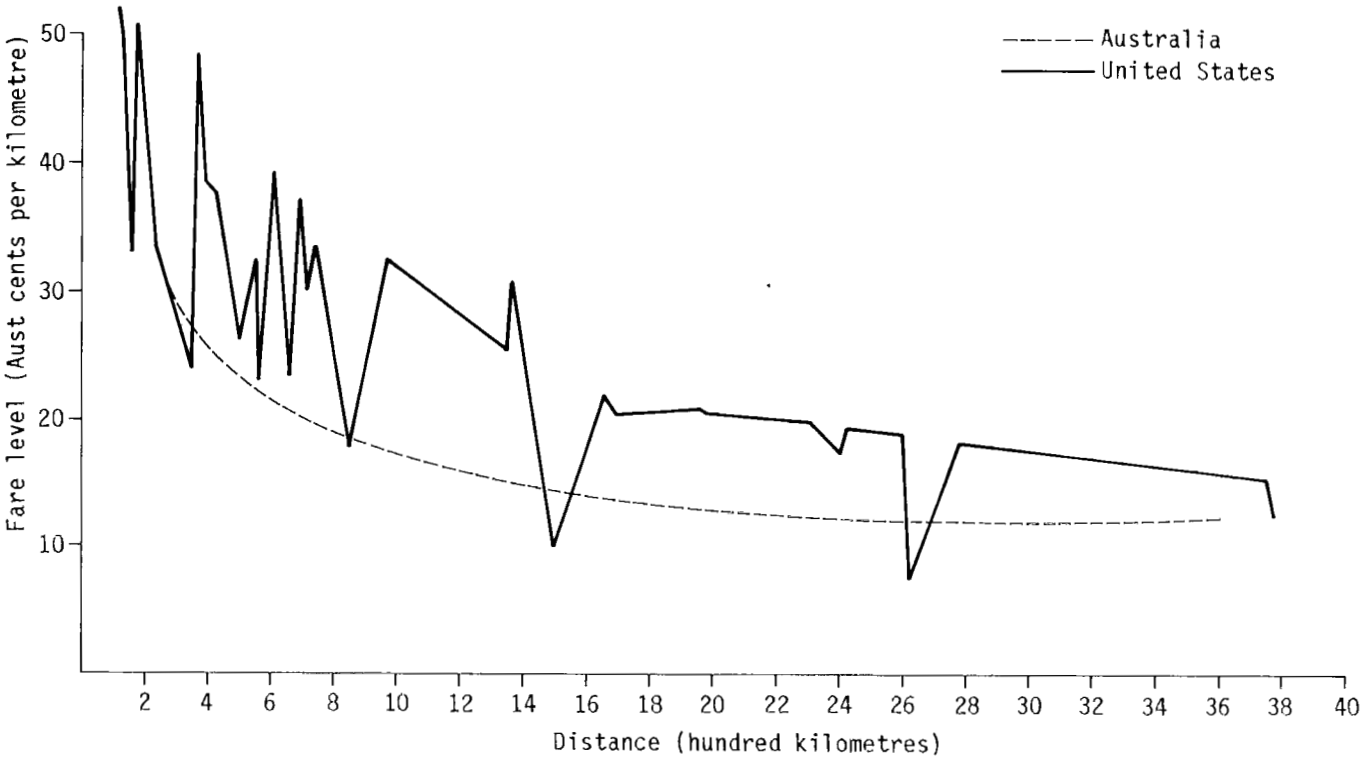
Comparison of air fares on selected routes

The most common approach in making domestic air fare comparisons between countries is to compare economy fares for routes of similar length. This approach may introduce bias into the comparison as the results are affected by the degree to which economy air fares reflect general fare levels. Figure 3.2 presents results for 36 US city pairs chosen to provide a broad geographic spread of short, medium and long-haul routes. The figure illustrates the wide variation in fares for routes of the same length.

The effect of the exchange rate problem discussed earlier is demonstrated in Figure 3.3. Between September 1984 and March 1985 the Australian dollar fell from US$0.8330 to US$0.7051. The impact of this depreciation was to lower the relative price of Australian economy fares (in terms of US dollars). Hence, if the March 1985 exchange rate is used a more favourable impression of the performance of the Australian airlines may be gained than if the November 1984 exchange rate is used.

The analysis of selected routes does not provide conclusive evidence on the relative levels of air fares in Australia and the US. The yield approach provides a more objective comparison and indicates that air fare levels were, on average, about 40 per cent lower in the US than in Australia for 1983-84. This conclusion is supported in an analysis by Trengove (1985) in which he calculated on a route by route basis the level of revenue that would be collected from passengers travelling on Australian routes if they had travelled on US routes of the same distance and paid average US fares. Trengove concluded from this analysis that US fares were 21 per cent lower than Australian fares in 1982 and the differential had increased since that time.

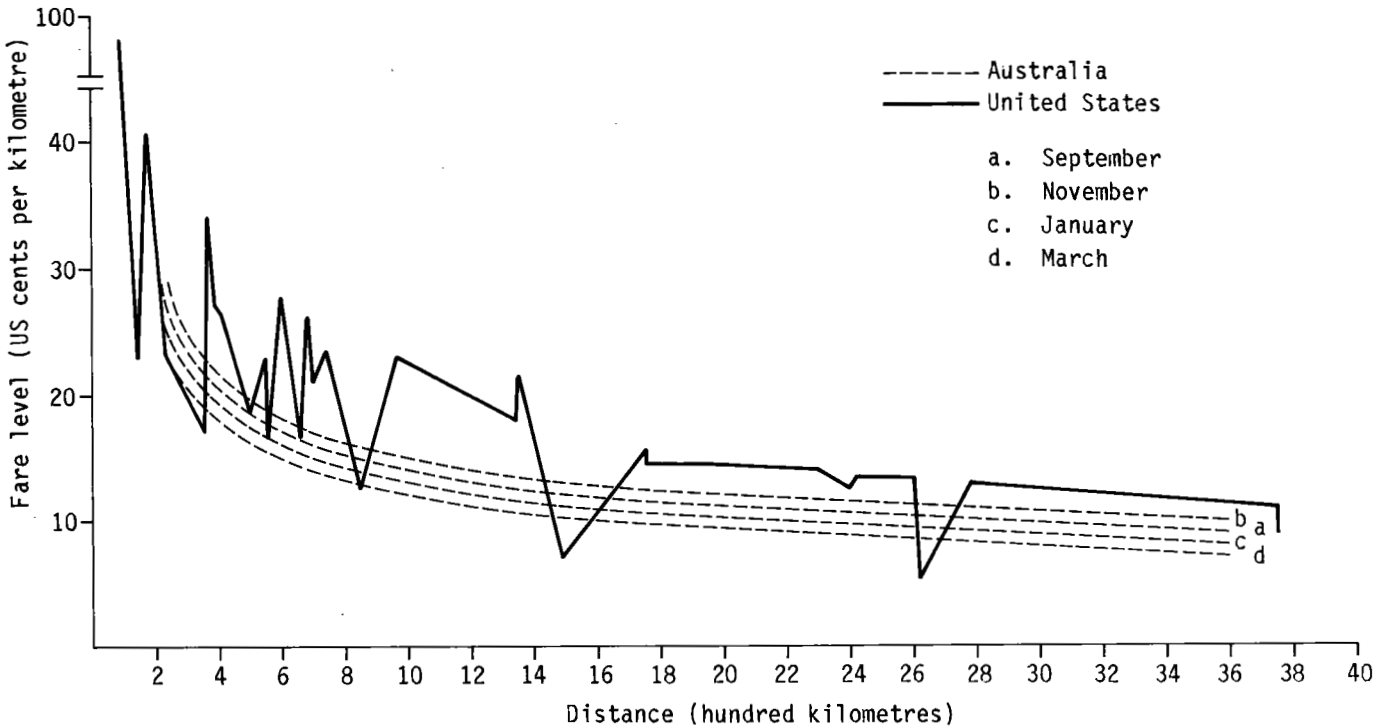
Higher average Australian fare levels may be indicative of allocative inefficiency. However, they may also reflect differences in cost relativities between Australia and the US. For example, the high level of Australian fares may simply be a reflection of higher operating costs due to higher Australian input costs or because of



Note: Australia-United States exchange rate end of March 1985: $A 1.00 = US$ 0.7051.

Sources: ABC World Airways Guide (1985). OAG (1985).

Figure 3.2-Economy air fares per kilometre, selected routes, Australia and United States, March 1985



Note: Australia-United States exchange rates, end of month: Sept 1984 $A 1.00 = US$ 0.8330, Nov 1984 $A 1.00 = US$ 0.8596; Jan 1985 $A 1.00 = US$ 0.8150; Mar 1985 $A 1.00 = US$ 0.7051.

Sources: ABC World Airways Guide (1985). OAG (1985).

Figure 3.3-Effects of exchange rate fluctuations on economy air fares per kilometre, selected routes, Australia and United States, September 1984 to March 1985

more restrictive operating conditions in Australia. The level of Australian domestic airline operating costs is examined when technical efficiency aspects are addressed later in this chapter.

Factor rents

The existence of factor rents in the provision of air services is another indicator of allocative inefficiency. It is therefore useful to examine:

- factor rents to capital, that is, airline profitability; and
- factor rents in terms of wages and salaries earned by airline employees.

Labour

Detailed information on wage levels in the industry is not currently available. However, an indication of trends in average employee compensation can be obtained by examining the experience of TAA.

Table 3.7 presents data on average earnings per employee at TAA and in

TABLE 3.7-AVERAGE EARNINGS AT TAA AND IN OTHER SECTORS OF THE AUSTRALIAN ECONOMY, 1974-75 TO 1983-84

	Annual average wage ($)			*Change on previous year (per cent)*		
Year	*TAA*	*Transport, storage, communi-cation*	*Australia*	*TAA*	*Transport storage, communi-cation*	*Australia*
1974-75	9 899	8 567	7 613	nil	nil	nil
1975-76	11 154	9 871	8 739	13	15	15
1976-77	12 364	10 955	9 652	11	11	11
1977-78	13 420	11 565	10 267	10	6	6
1978-79	14 787	12 441	11 138	10	8	9
1979-80	16 328	14 162	12 598	10	14	13
1980-81	18 027	16 029	13 599	10	13	8
1981-82	20 659	18 448	15 450	15	15	14
1982-83	23 389	19 569	16 232	13	6	5
1983-84	25 098	na	na	7	na	na

na not available

Sources: Trans Australia Airlines (1979 and 1984a). Australian Bureau of Statistics (1985b).

broader sections of the Australian economy between 1974-75 and 1983-84. Average wages at TAA rose by 136 per cent over the nine years to 1982-83 and this marginally exceeded the increases of 128 per cent in the transport, storage and communications sector and 113 per cent in the economy as a whole. The corresponding changes in real wages were 5 per cent, 1 per cent and -6 per cent. There were relatively high increases at TAA in 1975-76 and 1982-83.

These developments resulted in a slight improvement in the relative position of TAA employees. The ratio of nominal wages at TAA to those in the transport, storage and communications sector rose from 1.16 in 1974-75 to 1.20 in 1982-83 and the TAA/total economy ratio increased from 1.30 to 1.44 over this period. This does not provide evidence of the existence or absence of factor rents for labour. More disaggregated data comparing wages paid for similar tasks inside and outside the airline industry are required before any definite conclusions can be drawn.

Comparable data are not available for Ansett's trunk operations although maintenance of relativities would be expected to have resulted in similar trends[1].

Capital

Information on domestic airline profitability is provided in Tables 3.8 and 3.9. A more detailed financial analysis, based on annual reports of TAA and Ansett Transport Industries and the Clause 13 reports to Parliament for their airline operations, is presented in Appendix VII.

Over the 1981-82 to 1983-84 period, Ansett's gross profits and operating profit before tax were substantially higher than TAA's indicating that it had lower operating expenses and less dilution of revenue. This is reflected in Ansett's higher rate of return on assets. There is also evidence that the rate of return on Ansett's trunk operations is higher than for other Ansett Transport Industries' operations and for Australian industry as a whole.

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1. Information on total labour costs from ICAO (1984) suggests that the average labour cost per employee at Ansett in 1983 was $24 279. These costs include wages for pilots, other cockpit personnel, cabin attendants, maintenance and overhaul personnel, ticketing and other staff. The ICAO data also suggests that labour costs per Australian airline employee are lower than those of the US short-haul national airlines.

TABLE 3.8-TAA AND ANSETT AIRLINE REVENUE AND PROFITS, 1981-82 TO 1983-84

($ million)

Revenue	*1981-82*	*1982-83*	*1983-84*	*1984-85*[a]
TAA				
Total revenue[b]	502	537	623	695
Operating profit before tax[c]	-12.8	-26.5	17.0	30.0
Ansett[d]				
Trunk passenger revenue	537	553	601	695
Operating profit before tax	25.0	14.7	37.2	80.0

a. Profit and revenue projections for TAA and Ansett presented in Appendix VII.
b. Includes revenue from mail, freight and other airline related activities.
c. Adjusted to reflect the change in TAA accounting policy for interest payments.
d. Passenger operations only. Accurate directly comparable data for the two airlines are not available (see Appendix VII for further explanation).

Sources: Ansett Airlines of Australia (1983, 1984a). Trans Australia Airlines (1984b, 1984c).

TABLE 3.9-TAA AND ANSETT TRANSPORT INDUSTRIES GROSS PROFITS, 1981-82 TO 1983-84

	Gross profit[a] *($ million)*		*Return on assets*[b] *(per cent)*	
Year	*TAA*[c]	*Ansett*[c]	*TAA*[c]	*Ansett*[c]
1981-82	37.2	104.9	8.6	12.4
1982-83	34.9	110.2	6.5	10.0
1983-84	74.2	164.3	12.7	13.5

a. Gross profit is defined as trading revenue less operating expenses (other than depreciation and interest) or as operating profit before tax plus interest and depreciation less non-trading revenue.
b. Return on assets is gross profit divided by the average of total assets at the beginning and end of the financial year.
c. TAA figures are for total trunk operations, while Ansett figures are for passenger trunk operations.

Sources: Ansett Airlines of Australia (1983, 1984a). Trans Australia Airlines (1984b, 1984c).

Table 3.10 compares the rate of return on equity for TAA, Ansett Transport Industries and Australian industry in general over the ten years to 1983-84.

The rate of return earned on equity by Ansett Transport Industries was significantly higher than the national average between 1974-75 and 1983-84, the only exception being 1980-81. TAA's rate of return on equity also exceeded the national average in two years.

These data provide evidence that Ansett Transport Industries as a whole has consistently earned well above average profits. Airline operations have clearly been a substantial contributor to this

TABLE 3.10-RETURN ON EQUITY FOR TAA AND ANSETT TRANSPORT INDUSTRIES COMPARED TO AUSTRALIAN INDUSTRY, 1974-75 TO 1983-84[a]

(per cent)

			Australian industry	
Year	*TAA*	*Ansett*	*All industry*[b]	*Services industry*[c]
1974-75	7.4	14.2	8.6	9.8
1975-76	5.5	23.0	9.2	11.5
1976-77	9.1	22.8	9.6	13.5
1977-78	12.2	20.0	9.5	13.9
1978-79	27.4[d]	22.3	11.5	13.6
1979-80	30.6[d]	16.9	11.6	13.6
1980-81	10.4	12.6	10.0	13.2
1981-82	..	22.7	6.9	12.1
1982-83	..	19.4	6.3	8.8
1983-84	3.6	14.6	9.2[e]	na

a. Return on equity is calculated as net operating profit divided by the average of shareholders' funds at the beginning and end of the financial year.
b. The all industry figure covers all industry sectors excluding the financial sectors and includes manufacturing, wholesale, retail, services and mining industries.
c. The services industry includes the transport sector.
d. Reflects low level of TAA equity. See Appendix VII for further discussion of this aspect.
e. Preliminary.

na Not available
.. Not applicable, losses recorded in these years.

Sources: Ansett Transport Industries (1975 to 1984). Reserve Bank of Australia (1981 and 1985). Trans Australia Airlines (1975 to 1981, 1982a, 1983 and 1984a).

performance. It appears, therefore, that Ansett at least has been able to extract economic rents from passengers because of its strong position in the airline market. Excess profits earned in this manner will result in a reduction in allocative efficiency as fare levels could be lower while allowing normal profits to be earned. This situation almost certainly means that some consumers are being discouraged from using air services because of high fare levels and that the adjustment of fares to more accurately reflect costs would result in an improvement in allocative efficiency.

Projections of trunk airline profitability shown in Appendix VII suggest that high profitability is likely to continue. Substantial improvements in TAA and Ansett profitability are likely to occur in 1984-85 and 1985-86. Larger monopoly rents are therefore expected to be drawn by TAA and Ansett from airline passengers.

BTE examined the impact of a ten per cent reduction in the general level of air fares in 1984-85 year, based on the BTE profit projections discussed in Appendix VII. The consequences are likely to include:

- an increase of seven per cent or 650 000 in the number of trunk route passengers on the basis of BTE elasticity estimates in Chapter 2;
- Ansett and TAA would each have a reduction of $25 million to $670 million revenue for 1984-85;
- a saving of around $120 million in air fares paid by passengers; and
- an increase of about $20 million in airline costs for each airline to provide an increased number of flights to carry the additional passengers, given the excess aircraft capacity available to the airlines.

The reduced revenue and increased costs would result in a pre-tax operating profit for Ansett of about $35 million, which would represent a pre-tax return on equity of nearly 20 per cent. This return would be as good as any of the last three years, and might be considered as more than adequate for a low risk, low return industry.

TAA, by comparison, would probably have recorded a loss in 1984-85 if air fares had been reduced by 10 per cent. This reflects the effect of the engineers strike in December 1984 and the observation that TAA appears to carry a larger proportion of discount and concession fare passengers than Ansett.

An underlying assumption in this analysis is that TAA and Ansett are operating at peak technical efficiency, and that there is no scope whatever for any cost saving measures. Performance may be better than is suggested here if reducing air fares puts pressure on the airlines to pursue cost savings.

This example illustrates the magnitude of efficiency losses that might follow from the current price control arrangements. A cut in air fares improves allocative efficiency by increasing the number of passengers travelling and by reducing the fares paid by those already travelling. Technical efficiency is improved by higher aircraft utilisation, and possibly by an increased incentive to pursue cost minimisation. The losers are the airline shareholders because airline profitability will be reduced. However, the financial gain to consumers exceeds the loss to the airlines by a minimum of $30 million, and Ansett, at least, would still make sufficient profit in relation to its level of risk to encourage it to continue to provide airline services.

Parallel scheduling

Parallel scheduling of domestic trunk airline services has been a significant feature of airline competition in Australia for many years. The phenomenon is expected behaviour in a duopoly, especially when price and capacity competition have been constrained by regulation.

Parallel scheduling may reduce the range of departure times (and therefore the quality of service) offered to passengers. It may therefore indicate the existence of allocative inefficiency. Parallel scheduling may also result in technical inefficiency because of unwarranted expenditure on airport infrastructure designed to increase airport capacity to accommodate parallel aircraft departures and arrivals by the trunk airlines.

Table 3.11 compares the weekly incidence of parallel scheduling in December 1977 and March 1985.

In December 1977 the incidence of parallel scheduling was high on most routes with the exception of Sydney-Perth, Melbourne-Canberra and Hobart-Launceston. The relative incidence of parallel scheduling was marginally greater on high density routes.

The data for March 1985 indicate that the incidence of parallel scheduling has remained at high levels on high density routes relative

TABLE 3.11-WEEKLY INCIDENCE OF PARALLEL SCHEDULED FLIGHTS FOR SELECTED ROUTES, DECEMBER 1977 AND MARCH 1985[a]

Route	December 1977			March 1985		
	Parallel[b]	Non-parallel[c]	Per cent parallel	Parallel[b]	Non-Parallel[c]	Per cent parallel
Melbourne-Sydney	190	26	88.0	154	12	92.8
Sydney-Melbourne	193	25	88.5	146	16	90.1
Sydney-Brisbane	121	29	80.7	93	17	84.5
Brisbane-Sydney	126	19	86.9	96	14	87.3
Melbourne-Adelaide	74	13	85.1	66	3	95.7
Adelaide-Melbourne	63	8	88.7	46	23	66.7
Sydney-Canberra	72	28	72.0	34	27	55.7
Canberra-Sydney	72	27	72.7	38	20	65.5
Sydney-Adelaide	34	9	79.1	72	17	80.9
Adelaide-Sydney	45	4	91.8	66	10	86.8
Sydney-Coolangatta	20	3	87.0	24	4	85.7
Coolangatta-Sydney	20	2	90.9	30	15	66.7
Melbourne-Hobart	64	6	91.4	38	10	79.2
Hobart-Melbourne	60	9	87.0	44	5	89.8
Melbourne-Canberra	34	23	59.6	20	23	46.5
Canberra-Melbourne	28	28	50.0	20	24	45.5
Melbourne-Brisbane	20	4	83.3	104	15	87.4
Brisbane-Melbourne	20	8	71.4	108	26	80.6
Melbourne-Launceston	57	13	81.4	42	7	85.7
Launceston-Melbourne	35	23	60.3	30	13	69.8

TABLE 3.11 (Cont)-WEEKLY INCIDENCE OF PARALLEL SCHEDULED FLIGHTS FOR SELECTED ROUTES, DECEMBER 1977 AND MARCH 1985[a]

	December 1977			*March 1985*		
Route	*Parallel*[b]	*Non-parallel*[c]	*Per cent parallel*	*Parallel*[b]	*Non-Parallel*[c]	*Per cent parallel*
Melbourne-Perth	18	3	85.7	24	13	64.9
Perth-Melbourne	22	5	81.5	16	19	45.7
Adelaide-Perth	26	2	92.9	8	7	53.3
Perth-Adelaide	15	1	93.7	13	1	92.9
Sydney-Perth	2	5	28.6	48	3	94.1
Perth-Sydney	2	5	28.6	28	19	59.6
Melbourne-Coolangatta	6	2	75.0	28	13	68.3
Coolangatta-Melbourne	6	3	66.7	37	7	84.1
Launceston-Hobart	16	8	66.2	18	9	33.3
Hobart-Launceston	2	11	15.4	8	11	42.1

a. December 1977 flights are actual departure times, March 1985 are scheduled departure times.
b. Number of flights with departure times of one airline within fifteen minutes of the departure time of the other.
c. Number of flights where the departure times differ by more than fifteen minutes.

Source: Gannon (1979). Ansett Airlines of Australia (1984), Trans Australia Airlines (1984d).

to other routes and has generally increased over December 1977 levels.

Conversely the degree of parallel scheduling has generally declined on some low density routes. These reductions reflect a number of factors. The airlines have co-operated on some routes (such as Melbourne-Canberra and Sydney-Canberra) to separate departure times and changes in aircraft fleet composition may have resulted in changes in aircraft utilisation patterns.

The overall level of parallel scheduling does not appear to have reduced significantly between December 1977 and March 1985. Its continued existence implies that improvements in allocative efficiency can still be made in terms of satisfying consumer preferences regarding departure times.

TECHNICAL EFFICIENCY

Technical efficiency is achieved when a given output is produced at minimum cost. Hence, the cost of inputs and the nature of production are important considerations.

Airline cost levels are determined by a number of factors including:

- input prices;
- route characteristics such as density;
- demand characteristics; and
- the degree of competition between airlines (or the incentive to reduce or contain costs).

The impact of these factors on technical efficiency is difficult to assess. Ideally technical efficiency should be assessed by estimating an airline production function. However, difficulties associated with defining airline production functions complicate this task, and limited work in this area has been undertaken (see for example, Mackay 1979). The discussion in this chapter is restricted to input prices, aircraft utilisation and labour productivity. In addition, a cost comparison between the Australian domestic airlines and a selection of US airlines provides further information on levels of technical efficiency in the domestic airline market.

Trends in input prices

Direct operating costs comprise several components including:

- fuel costs
- labour costs

- maintenance expenses
- air navigation charges.

A detailed analysis of these costs is presented in Appendix VI.

Aviation fuel (avtur) prices increased by approximately 85 per cent in real terms between 1977 and 1985. This represents an average annual increase of approximately 8 per cent. Fuel costs formed approximately 30 per cent of TAA's direct operating costs in 1974-75 and approximately 40 per cent in 1983-84. This increase was mitigated by changes in fleet composition, such as the introduction of wide-bodied aircraft which could be expected to reduce fuel consumption per available seat-kilometre.

Crewing costs at TAA also increased significantly between 1979-80 and 1983-84. Flying crew costs rose by 16 per cent in real terms between 1979-80 and 1983-84 which represents an annual average increase of approximately 4 per cent. However, crewing costs have not increased significantly as a proportion of total direct operating costs.

Information from TAA's annual reports indicates that maintenance costs declined in real terms between 1979-80 and 1983-84. In addition, maintenance costs have fallen as a proportion of total direct operating costs. This may be attributable, in part, to the introduction of more modern and larger capacity aircraft. However, the decline in maintenance costs has been accompanied by a greater fall in average annual aircraft utilisation, resulting in rising maintenance costs per flying hour.

Air navigation charges paid by the two domestic airlines increased in real terms between 1979-80 and 1983-84. Collections from Ansett for trunk airline operations increased by approximately 45 per cent while TAA's payments rose by 26 per cent over the same period in real terms. However, air navigation charges did not increase significantly as a proportion of total direct operating costs.

Aircraft utilisation and load factors

Table 3.12 provides information on average aircraft utilisation[1] for TAA and Ansett for the five years to 1983-84.

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1. Average aircraft utilisation represents the average hours flown by one aircraft over one year and is calculated by dividing the total hours flown by an aircraft type by the average number of aircraft of that type during the year.

TABLE 3.12-AVERAGE AIRCRAFT UTILISATION, TAA AND ANSETT, 1978-79 TO 1982-83[a]

	1979-80		*1980-81*		*1981-82*		*1982-83*		*1983-84*	
Airline	*Aircraft number*	*Average utilisation (hours)*	*Aircraft number*	*Average utilisation (hours)*	*Aircraft number*	*Average utilisation (hours*	*Aircraft number*	*Average utilisation (hours)*	*Aircraft number*	*Average utilisation (hours)*
Ansett										
B727-200	11	3 958	13	3 732	16	3 320	16	2 923	12	2 526
B737-200	-	-	-	-	12	2 861	12	2 625	12	2 463
DC9	12	3 038	12	3 035	3	2 434	-	30	-	-
F27	11	1 902	9	2 126	5	2 183	5	1 781	5	1 921
B767-200	-	-	-	-	-	-	2	4 350	4	2 157
B727-100	-	1 081	-	-	-	-	-	-		
Total	34	2 820	34	3 020	36	2 837	35	2 630	33	2 556
TAA										
A300	-	-	-	-	3	3 339	4	2 354	3	2 182
B727-200	11	3 966	12	3 654	12	3 334	12	3 150	13	3 035
DC9	12	3 061	12	3 060	8	2 531	9	2 789	9	2 683
F27	12	2 401	10	2 389	7	2 042	3	1 424	3	1 533
B727-100	-	2 926	-	-	-	-	-	-	1	1 319
Total	35	3 102	34	3 058	30	2 742	28	2 664	29	2 633

a. The figures for aircraft numbers are the number of aircraft as at the end of June. This explains the apparent inconsistency of hours flown without corresponding aircraft. Aircraft leased overseas are not included.

na not available

- nil

Sources: Department of Aviation (1983b and 1984c). Department of Transport (1981 and 1982).

The important feature of these data is the decline in utilisation of all aircraft types of both airlines. In the case of Ansett total average utilisation fell by 464 hours or 15 per between the peak in 1980-81 and 1983-84. Large declines in the use of B727-200s and DC9s occurred. Utilisation of the B767-200 also dropped sharply in 1983-84.

A similar decline in average aircraft utilisation occurred at TAA. Total average aircraft utilisation fell by 482 hours or 15.5 per cent over the five years but this was accompanied by a reduction in fleet size. The most significant of these changes was the sharp fall in average utilisation of the A300 Airbus.

The decline in total fleet utilisation of both airlines suggests that excess capacity may currently exist. For example, in 1980-81 total fleet utilisation by Ansett and TAA was 102 680 hours and 103 972 hours respectively. This was achieved in both cases by the airlines using 34 aircraft. However, in 1983-84 total utilisation had fallen to 73 260 hours for Ansett and 75 980 hours for TAA. This was achieved by using 33 and 29 aircraft respectively. A comparison of both years suggests that a similar utilisation pattern to that achieved in 1983-84 could have been reached using fewer aircraft.

Table 3.13 indicates that the decline in average aircraft utilisation has been accompanied by little change in load factors over the same period. In the case of Ansett, load factors have risen by approximately 0.3 per cent while a fall of approximately 1 per cent was experienced by TAA over the same period. Load factors for both airlines peaked in 1980-81 and have subsequently declined. Periods of high load factors have coincided with periods of high aircraft utilisation.

Labour productivity

Table 3.14 provides information on the productivity of employees at TAA and Ansett measured in terms of output per employee for the five years to 1983-84.

No general conclusion may be drawn on the relative productivity of the employees of both organisations in terms of available tonne-kilometres (ATK) or revenue passenger-kilometres (RPK). However, the data suggest that productivity improvements have occurred at both TAA and Ansett over the period.

Labour productivity at Ansett has risen by 24 per cent in terms of ATK

and 17 per cent in terms of RPK between 1979-80 and 1983-84. Smaller increases in productivity have occurred at TAA. In terms of ATK labour productivity has risen by 7 per cent and by 5 per cent in terms of RPK.

Overseas cost comparisons

The information presented above does not on its own provide any indication of the degree of technical efficiency of the Australian trunk airlines. While some cost components have increased in real terms, this may reflect the impact of factors other than technical inefficiency. One means of gaining an insight into levels of technical

TABLE 3.13-PASSENGER LOAD FACTORS[a], TAA AND ANSETT, 1978-79 TO 1983-84

(per cent)

Airline	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*
Ansett	73.4	74.7	72.1	69.3	72.9
TAA	73.7	76.3	70.9	67.9	73.6

a. Passenger load factors are defined as the proportion of revenue passenger-kilometres to seat-kilometres available.

Source: Department of Aviation (1981c, 1982c, 1983c, 1983d, forthcoming).

TABLE 3.14-AVAILABLE TONNE-KILOMETRES AND REVENUE PASSENGER KILOMETRES PER EMPLOYEE, TAA AND ANSETT, 1979-80 TO 1983-84

('000)

	Available tonne-kilometres per employee		*Revenue passenger-kilometres per employee*	
Year	*Ansett*	*TAA*	*Ansett*	*TAA*
1979-80	74.3	76.1	496.8	511.7
1980-81	80.0	74.7	537.6	513.8
1981-82	86.4	79.9	558.5	522.9
1982-83	82.3	85.0	514.0	525.6
1983-84	92.2	81.2	582.2	536.9

Note: All data are for year ended June except Ansett employment figures which are as at December. Ansett December figures are used to approximate end of year figures.

Sources: Department of Aviation (1981c, 1982c, 1983c, 1983d, forthcoming). ICAO (1984c).

efficiency achieved by the Australian domestic airlines is to compare their performance with overseas airlines. This section draws comparisons between TAA and Ansett and the US national short-haul group used earlier in the fare comparisons for a series of financial and operational performance measures.

The comparative size of the US short-haul nationals and Australian airlines is illustrated in Table 3.15. The table shows that on average the US airlines carried almost six million passengers in 1983, nearly 40 per cent more than each of the Australian airlines.

However, average stage lengths in 1983-84 were slightly lower for the

TABLE 3.15-DESCRIPTIVE MEASURES FOR SELECTED AIRLINES, 1983-84

Airline	*Passenger numbers*[a]	*Revenue passenger-kilometres (million)*	*Available tonne-kilometres (million)*	*Operating revenue ($Am)*[b]	*Employee numbers*
TAA	4 302	4 267	645	623	7 825
Ansett[c]	4 367	4 279	678	601	7 350
Air Cal	3 565	2 304	508	302	1 842
Frontier	6 002	6 633	1 355	669	5 378
Midway	984	1 109	306	139	920
New York	1 921	1 235	245	172	1 048
Ozark	4 842	4 238	992	510	3 974
PSA[d]	8 097	5 012	1 149	531	3 654
People Express	na	8 545	1 211	464	2 811
Piedmont	11 701	9 266	2 090	1 123	7 964
Southwest	10 790	7 030	1 590	557	3 389
Short-haul nationals					
Total	47 902	45 372	9 446	4 469	30 980
Average	5 987	5 041	1 050	497	3 442

a. ICAO statistics for calender year 1983.
b. Exchange rate used was $A1.00 = US$0.905.
c. Trunk route passenger services only.
d. Pacific Southwest Airlines.

na not available

Sources: Ansett Airlines of Australia (1984a). CAB (1984). Department of Aviation (1984c and forthcoming). ICAO (1984a, 1984b, and 1984c). Trans Australia Airlines (1984c).

US airlines, so that revenue passenger-kilometres were about 20 per cent above the levels of the Australian airlines. The US airlines provided approximately 60 per cent more capacity as measured by available tonne-kilometres, suggesting that load factors were much lower than in Australia. Despite this higher capacity, average revenue was nearly 20 per cent lower for the US airlines, and average employee numbers were about half the Australian level.

The financial performance of the eleven airlines is summarised in Table 3.16. The Australian and US figures are drawn from different sources, and it is possible that there might be differences in definitions of revenue and expenses . However, variations caused by these definitional problems should not significantly change the conclusions drawn in the following analysis.

The cost of supplying airline capacity is shown in Table 3.16 as operating expenses per available tonne-kilometre. On average, the Australian airlines incur costs that are nearly twice as high as those of the US airlines. This does not necessarily mean that Australian airlines require twice as many inputs to supply a particular capacity as their US counterparts because the prices of certain inputs may be higher in Australia than in the US. However, it does suggest that higher input levels are required by Australian airlines.

When operating expenses are compared with airline output, the disparity between the US and Australian airlines is reduced. On average, the costs per passenger-kilometre of the Australian airlines are about one-third higher than those of the US carriers. The better performance of Australian airlines on this measure reflects the high load factors achieved in Australia. Operating revenue per revenue passenger-kilometre shows a similar result, with the Australian figure about 40 per cent above the US average.

Two US airlines, Midway and New York Air, report similar cost and revenue levels to TAA and Ansett. These airlines are the smallest of the nine US carriers. New York Air operates relatively short stages, which would be expected to increase costs. On the other hand, there are two airlines well below the US average, People Express and Southwest. These two carriers report cost and revenue levels which are approximately half the Australian level per unit of output.

There is a marked variability in the profitability of the nine US airlines. Two recorded operating losses in 1983-84 while three earned operating profits of over 1 cent per revenue passenger-kilometre or

over 10 per cent of revenue. The operating profit of TAA was similar to the US average, while that of Ansett was higher than any of the US airlines and more than twice as high as the US average.

Table 3.16 also shows the average performance of the US major

TABLE 3.16-FINANCIAL PERFORMANCE MEASURES OF SELECTED AIRLINES, 1983-84

Airline	*Operating expenses per ATK*[a] *(cents)*	*Operating expenses per RPK*[b] *(cents)*	*Operating revenue per RPK*[b,c] *(cents)*	*Operating profit per RPK*[b] *(cents)*	*Profit margin*[d] *(per cent)*
TAA	89.8	13.6	14.6	1.0	6.9
Ansett[e]	74.6	11.8	14.1	2.2	15.9
Air Cal	53.6	11.8	13.1	1.3	10.0
Frontier	50.1	10.2	10.1	-0.1	-1.1
Midway	49.3	13.6	12.5	-1.1	-8.4
New York	66.9	13.3	13.9	0.6	4.6
Ozark	49.7	11.6	12.1	0.4	3.6
PSA[f]	45.4	10.4	10.6	0.2	1.8
People Express	36.0	5.1	5.4	0.3	6.2
Piedmont	47.8	10.8	12.1	1.4	11.2
Southwest	30.1	6.8	7.9	1.1	14.2
Short-haul nationals average	44.4	9.2	9.9	0.6	6.3
Majors Domestic average	41.4	9.7	10.1	0.4	3.8

a. Available tonne-kilometre.
b. Revenue passenger-kilometre.
c. Figures shown may differ from those in Table 3.6 as Table 3.6 figures relate to passenger revenue only.
d. Operating profit before tax divided by revenue.
e. Trunk route passenger services only.
f. Pacific Southwest Airlines.

Note: Operating expenses exclude interest payments following US airlines' accounting practice.

Sources: Ansett Airlines of Australia (1984a). CAB (1984). Department of Aviation (1984c and forthcoming). ICAO (1984a, 1984b and 1984c). Trans Australia Airlines (1984c).

airlines[1] for their domestic operations. The majors recorded operating cost and revenue performances that were very similar to those of the short-haul nationals, although profitability was somewhat lower.

Operational performance measures are shown in Table 3.17. The high

TABLE 3.17-OPERATIONAL PERFORMANCE MEASURES OF SELECTED AIRLINES, 1983-84

Airline	*Passenger load factor (per cent)*	*Average aircraft utilisation (hours)*[b]	*Revenue per employee ($'000)*	*RPK*[a] *per employee ('000 km)*
TAA	73.6	2 633	79.6	545
Ansett[c]	72.9	2 556	81.8	582
Air Cal	56.8	2 640	164.0	1 251
Frontier	60.2	2 544	124.6	1 233
Midway	51.7	1 745	151.1	1 205
New York	54.6	3 819	164.1	1 178
Ozark	54.7	2 631	128.6	1 066
PSA[d]	54.9	2 762	145.3	1 372
People Express	71.6	3 019	165.1	3 040
Piedmont	53.9	2 483	141.0	1 163
Southwest	60.8	3 787	164.4	2 074
Short-haul nationals average	58.3	2 748	144.3	1 465

a. Revenue passenger-kilometres.
b. Utilisation for short-haul nationals estimated using hours flown in 1983 calendar year and average number of aircraft for 1983. TAA and Ansett figures are for 1983-84.
c. Trunk route passenger services only.
d. Pacific Southwest Airlines.

Sources: Ansett Airlines of Australia (1984a). CAB (1984). Department of Aviation (1984c and forthcoming). ICAO (1984a, 1984b and 1984c). Trans Australia Airlines (1984c).

1. American, Continental, Delta, Eastern, Northwest, Pan American, Republic, Trans-World, United, US Air and Western Airlines - with average operating revenue of A$3.4 billion.

load factors achieved by TAA and Ansett, which assist in reducing the impact of the relatively high cost of capacity provision for the Australian airlines, are evident. The load factors for the US airlines fall into the 50 to 60 per cent range with the exception of People Express, which recorded a load factor of 71.6 per cent in 1983-84, very close to that of the Australian airlines.

The performance of the Australian airlines with regard to aircraft utilisation appears to be comparable to that of the US carriers. This suggests that Australian airlines are not technically inefficient in the employment of capital resources.

However, there is evidence that Australian airlines are considerably less efficient than their US counterparts in the employment of labour resources. As noted earlier, Australian carriers employ more than twice as many staff to produce about 20 per cent less output (in terms of revenue passenger-kilometres). As a result, labour productivity (output per employee) is about two and a half times as high in the US. It has been argued that US airlines are able to contract work out to independent suppliers, in a way that Australian airlines are unable to do. As a result more maintenance work, for example, may be undertaken in-house in Australia. However, such factors are unlikely to explain the difference between US and Australian airlines. There is also considerable variation in labour productivity amongst the US carriers, with a factor of almost three between Ozark, the least productive airline in the employment of labour, and People Express, the most productive airline. The same general conclusion follows from comparing revenue with the number of employees, although as the US airlines earn about 40 per cent less revenue per passenger-kilometre, the difference between Australian and the US airlines is less pronounced.

It is recognised that this comparative analysis of airline performance has certain limitations. For example, data have been drawn from various sources which may not be precisely comparable. Objections might also be raised to the airlines chosen for comparison and because the measures relate only to certain aspects of airline performance. However, some tentative conclusions on the efficiency of Australian airlines can be drawn. These include:

- the cost of supplying airline capacity is high in Australia;
- to some degree this is offset by the high load factors of Australian airlines;
- Ansett profit margins were high by US standards in 1983-84;

- aircraft are employed in an efficient manner in Australia, both with regard to annual utilisation and load factors;
- however, labour productivity appears to be poor in Australia.

These conclusions are not new and have been drawn from other analyses of Australian airline performance (for example, Mackay 1979, Hocking 1979 and Kirby 1984). Attention has consistently been drawn to high overall costs, high fares, high aircraft utilisation and low labour productivity. Little evidence to dispute these conclusions has been discovered.

EQUITY

It was noted in Chapter 1 that equity is difficult to define precisely. However, some notion of fairness underlies all equity concepts.

Fairness may imply many things in the case of the provision of air services. For example, it may refer to equality of access to air services, or setting of fares in a consistent manner. Both of these objectives have been satisfied in Australia through subsidisation of particular services, either through direct government subsidisation or potential cross-subsidisation through the air fares formula.

Direct subsidies by Commonwealth Government

The Commonwealth Government provides direct subsidies for the operation of air services to selected remote areas of Queensland, Western Australia, the Northern Territory and South Australia. Subsidies for specific services between Melbourne and Tasmania and in western Queensland have also been provided by the Commonwealth Government. In addition, there are broader forms of government assistance such as support for development of aerodromes and loan guarantees to airlines for the purchase of aircraft.

Table 3.18 provides information on direct subsidy payments by the Commonwealth Government over the five years to 1984-85. This shows that there has been a steady increase in subsidy payments to remote area services over the four years to 1983-84. However, support for services operating between Melbourne and Tasmania and in western Queensland has now been phased out.

The level of subsidy for each remote area service is based on an assessment of the operator's costs by the Deparment of Aviation. In addition, a number of criteria are used in assessing whether

TABLE 3.18-DIRECT AIR SERVICE SUBSIDIES PAID BY COMMONWEALTH GOVERNMENT, 1980-81 TO 1984-85

($'000)

Service	*Year*				
	1980-81	*1981-82*	*1982-83*	*1983-84*	*1984-85*[a]
Remote areas	327	369	412	469	466
Melbourne-Tasmania	412[b]	4 176	4 800	5 238	5 630
Western Queensland	-	167[b]	1 000	1 192	1 125
Total	739	4 712	6 212	6 899	7 221

a. Budget allocation.
b. Subsidy only paid for part of year.

\- no payment

Note: Figures may not add to totals due to rounding.

Sources: Department of Aviation (1982b, p66). Department of Aviation (1983b, pp14 and 90). Department of Aviation (1984c, pp58 and 160). Department of Transport (1981b, p149). Minister for Aviation (1984).

subsidised services should be extended to a new port of call. Assistance may be provided if:

- weather conditions render the location inaccessible by road for a significant part of the year;
- there are educational, welfare or medical reasons for a regular air service;
- users of the aerodrome are willing to pay an agreed minimum charge for a commuter air service to call there.

An application may be rejected if:

- there is insufficient demand;
- the port is within one hour's comfortable drive of a centre of population where basic economic and social necessities are catered for;
- the port is served by or close to a sealed main road;
- the port is within 60 kilometres of and easily accessible to another aerodrome;
- the port is already served by the station's own aircraft.

Direct subsidies by State Governments

Several State governments also provide financial assistance to air services in the form of both direct subsidies to operators and by way of other schemes. There is considerable variation in the level and range of support provided by individual States. For example, the major form of Queensland Government assistance has been for F27 services on the Brisbane-central Queensland and Townsville-Mount Isa routes. In 1983-84 payments under this scheme amounted to $1.2 million and an allocation of $1.1 million has been made in the 1984-85 Queensland Government Budget. The Queensland Government has made no announcement on the future of this scheme following the Commonwealth Government announcement that it was discontinuing its support.

The Western Australian Government provides subsidies to operators of services to isolated areas of the State including:

- Perth-Murchison region
- Paraburdoo-Onslow
- Paraburdoo-Wittenoom
- the Kimberley region.

In addition, there are several broader subsidy schemes which provide less direct support to air service operators, including travel assistance for students and pensioners. Total subsidy payments made by the Western Australian Government to air services in 1983-84 were of the order of $740 000.

The Tasmanian Government currently provides a subsidy for air travel by residents of King Island and Flinders Island by paying 10 per cent of the fare. An allocation of $23 700 was made for this purpose in the 1983-84 State budget. Additional assistance has been provided through loans and guarantees for the purchase of aircraft.

The only direct assistance to operators provided by the South Australian Government is a contribution to the subsidy for the weekly service through remote areas in the north-east of the State to southern Queensland. Estimated expenditure in 1984-85 is $22 973.

No assistance is provided by the New South Wales, Victorian and Northern Territory governments.

Equity impact of the air fare formula

In addition to the availability of direct government subsidies,

certain passengers and regions may be implicitly assisted through the existence of cross-subsidisation as a result of the air fares formula.

Cross-subsidisation involves a divergence between prices and costs in the provision of different air services and specifically refers to the situation where some passengers may pay fares which exceed marginal cost while other passengers may pay fares that are less than marginal cost. Where this occurs those passengers who are paying fares less than marginal cost will be encouraged to over-consume air services. If fares were set to reflect costs some of these passengers would be excluded from the market and a more efficient allocation of resources would follow.

The main purpose of the air fares formula is to ensure that all air fares are set on a nationally consistent basis. Accordingly, fares will be the same for two different routes of the same distance irrespective of whether the costs of operating services over these routes are substantially different. Under these circumstances cross-subsidisation may occur.

There is no substantive information to indicate the extent of cross-subsidisation. It is possible that passenger fares on developmental routes in northern Australia, for example, do not cover marginal cost. However, even if cross-subsidisation does not exist (insofar as all passengers are paying air fares greater than marginal cost), pricing distortions will still occur when average costs are used to determine air fares. For example, it was noted in BTE (1982, p8) that the uniform application of fare formulae may favour high cost routes at the expense of low cost routes. Some loss in economic efficiency will follow as a result.

This demonstrates that a trade-off exists between economic efficiency and equity. The direct subsidisation of specific services may serve to minimise efficiency losses. However, the calculation of fares on the basis of average costs will distort fare relativities and therefore resource allocation. Losses in economic efficiency will occur as a result.

SUMMARY

The analysis in this chapter identifies a number of areas where the Australian trunk airlines have performed well. Australian airlines as a whole have an excellent safety record compared with overseas airlines. A wide range of fares and service levels are available and

are likely to satisfy some consumer preferences. The high load factors achieved by the domestic trunk airlines are indicative of technical efficiency, and aircraft utilisation, while declining in recent years, is comparable to the US airlines examined. Equity goals are also likely to be achieved through direct government subsidisation and the determination of fares through a national air fares formula.

However, there are a number of areas where domestic trunk airline performance can be improved. The determination of fares through the fares formula is not conducive to allocative or technical efficiency. Little account is taken of demand factors and the determination of fares on an essentially cost-plus basis provides scope for cost-padding. The range of fares, although wide, may not be allocatively efficient because of the existence of latent demand. Furthermore, a comparison of average fare levels in Australia and the US indicates that average Australian fares are higher.

Information on trunk airline profitability suggests that monopoly rents are being drawn by the airlines, especially by Ansett. Profitability projections for 1984-85 and 1985-86 indicate that this situation will continue.

Labour productivity, in terms of output per employee, has increased for both airlines in recent years but it is low in comparison to the US States airlines. In general, the cost of supplying capacity is much higher in Australia than in the US.

CHAPTER 4-THEORY OF MARKET STRUCTURE AND ITS APPLICATION TO THE AIRLINE INDUSTRY

This chapter provides some theoretical background on market structures and the application of the theory to the airline industry. The chapter consists of four parts:

- a description of the various types of market structure and their economic effects;
- usefulness of this theory in explaining the current airline industry structure and behaviour;
- a discussion of the theoretical determinants of market structure in industries; and
- application of market structure theory to the airline industry.

TYPES OF MARKET STRUCTURE

The structure of an industry (that is, how the industry is organised) takes into account such features as the number of firms operating in the industry, the degree of control over price by firms, how closely the products of the various firms substitute for each other, the freedom of firms to enter and exit an industry and the extent of non-price competition. Industry structure has an important bearing on the individual behaviour of firms and on the output, prices, costs and profits resulting in a particular market.

Industries are usually classified into four different market types:

- perfect competition
- monopoly
- monopolistic competition
- oligopoly.

Real world industries do not necessarily fall precisely within one classification, or another, but may be a mixture of two or more types. The choice of model to use to analyse a given market situation may therefore be a matter of judgement.

Perfect competition

Perfect competition stands at one extreme of possible market structures and provides a standard against which other market structures can be compared and evaluated. In addition, it brings out fundamental cause and effect relationships which are also found in 'imperfectly' competitive markets despite the existence of various constraints.

Perfectly competitive markets possess the following characteristics:

- there are many firms in the industry, none of them large;
- the product of any one firm is identical to the product of any other firm;
- there is perfect mobility of all resources, including unrestricted entry into and costless exit out of the industry;
- non-price competition in the form of sales promotion and advertising is non-existent; and
- consumers, producers and resource owners possess complete and perfect knowledge.

The characteristics of this market structure ensure that no individual firm is able to influence the selling price of the product. The market price is determined by the interaction of market demand and total industry supply and the perfectly competitive firm can sell all it wishes at the prevailing market price. Firms act entirely independently of each other and no single firm's market decisions affect, or are affected by other firms in the industry.

Perfect competition provides a very high degree of economic efficiency in long-run equilibrium because:

- the product will be produced at the least possible cost per unit of production;
- the price of the product will equal the average cost of production (resulting in zero economic profits, or 'normal' profits);
- however, the identical nature of products may restrict consumer choice (although in theory separate perfectly competitive markets could exist for differing qualities of a certain product).

The conditions of perfect competition are very difficult to achieve in practice. The model is therefore of limited usefulness for policy purposes and this led to development of the concept of 'workable

competition'. Workable competition is an attempt to identify plausible 'real world' conditions which would provide the same sort of efficiency advantages as perfect competition. Thus workable, or effective, competition exists when firms are induced by the pressures of competition to keep prices down to the level of costs, to seek out ways of reducing costs, to innovate in their production techniques and to offer new products to the consumer. The main requirements for workable competition are that firms are free to compete by offering lower prices and better service on products, and that no individual seller has the power to limit the freedom of entry of new firms to the industry.

The results of workable competition bear a close resemblance to the economic efficiency criteria for an industry defined in Chapter 1. In practice the aim to make an industry behave 'competitively' is more closely linked to workable competition than perfect competition.

Monopoly

The opposite theoretical market structure to perfect competition is monopoly. The primary difference between the two structures rests on the demand situations faced by the firm and on the entry conditions to an industry.

The main characteristics of a pure monopoly are as follows:

- there is a single seller of a product for which there are no close substitutes;
- the firm faces the total market demand for its product;
- entry into the industry is often blocked; and
- the firm may engage in some sales promotion activities.

The monopolist thus has a considerable degree of control over the price of its product within limits set by the amount of output it wishes to sell (to sell more it is forced to reduce its price). The actions of a monopolist may also be constrained by the indirect 'competition' of all other goods and services, by reasonably adequate substitute goods and by the threat of potential competition if market entry is possible.

A monopoly market structure would be less efficient than perfect competition in most respects:

- the product is unlikely to be produced at the least possible cost

in the long-run (it would be pure coincidence if the monopolist's market size resulted in a profit-maximising output at the least possible cost)[1];

- the price of the product will usually exceed average cost in the long-run (that is, there will be pure economic profits); and
- the consumer has no choice of products between firms, but the monopolist may produce several products which are close substitutes.

However, the loss of technical efficiency in monopoly, relative to perfect competition, is only of concern for industries in which perfect competition could exist. In markets where substantial economies of scale (or scope) are present, monopoly may result in lower costs than would occur if there were many firms each producing on a relatively small scale[2].

Monopolistic competition

Monopolistic competition differs from perfect competition in only one major respect: firms in the industry do not produce identical products. Thus:

- there are many firms in the industry;
- the product that each firm sells is differentiated from the products sold by competitors;
- there is generally unrestricted entry into and costless exit from the industry; and
- some advertising may occur.

Although products are differentiated they are still good substitutes for each other. The small amount of product differentiation does, however, give each firm a small amount of control over price. The large number of firms means that the activities of one firm will have a minimal effect on others in the industry.

A highly efficient outcome is possible for industries described by monopolistic competition because the unrestricted entry and costless exit of firms allows effective competition:

- the product will not be produced at the least possible cost in

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1. In practice the protected market position of a monopolist may also serve to reduce its incentive to minimise costs.
2. The concepts of 'economies of scale' and 'economies of scope' are discussed in the third part of this chapter.

the long-run, but will approach this situation the more sensitive a firm's output is to price changes;

- the price of the product will generally equal average cost (resulting in normal profits) in the long-run unless entry by new firms is restricted in some way; and
- there is generally a broader range of products for consumer choice than will occur in any other form of market structure.

Oligopoly

Oligopoly is a market situation that sits between monopoly on the one hand and perfect competition and monopolistic competition on the other. The major characteristics of oligopolies are:

- the number of firms in the industry is small enough for a single firm's pricing and output activities to significantly affect other firms;
- products may range from being virtually identical to highly differentiated (some product differentiation is the usual situation);
- the relative freedom of entry into the industry will vary, but generally entry will be restricted to some degree; and
- firms in the industry frequently engage in non-price competition.

The key feature of oligopolies is the interdependence of firms. The actions of each firm can have a significant impact on other firms. This is in complete contrast to monopolistic competition (and perfect competition) where so many firms are in the market that the actions of each are imperceptible to the others. If only two firms exist in an industry, the special oligopoly case of duopoly exists.

There are many models of oligopoly behaviour and thus it is difficult to be precise about the economic effects of this type of industry structure. Highly collusive oligopolies and duopolies tend to approximate monopoly behaviour, with lower output levels and more rigid, higher prices compared with more competitive markets. In general the lower the degree of collusion in an industry the greater will be output and the lower will be price.

General efficiency consequences of an oligopoly market structure are:

- the product is unlikely to be produced at the least possible cost in the long-run (for similar reasons to the monopoly case);
- the price of the product will usually exceed average cost in the

long-run (because of restricted entry), allowing pure economic profits; and

- there will generally be a broader range of products than that provided by monopoly or perfect competition.

As with monopoly, however, the oligopolist may be able to produce with lower long-run unit costs than firms operating under perfect competition or monopolistic competition if economies of scale in the industry are large in relation to market size.

Contestable markets

The economic theories discussed above place the primary emphasis on the number of firms in an industry to explain market structure, with barriers to entry as an important secondary consideration. A relatively recent development in the theory of industry structure, the theory of contestable markets[1], changes this emphasis by asserting that the number of competing firms has little bearing on the level of efficiency in an industry. Rather it is the freedom of firms from outside an industry to potentially enter a market (to 'contest' for it) and to exit a market without any cost penalties that provides the competitive conditions required for an efficient market outcome.

A perfectly contestable market is one in which entry is absolutely unrestricted, exit is absolutely costless and the pricing practices of the market are such as to allow an entrant a prospect of profit. Under these conditions even transient profit opportunities may attract entrants to the market. In fact, the easy entry and exit conditions ensure that the mere threat of entry induces the industry's incumbents, whether oligopolists or a single-firm monopolist, to behave in a highly competitive manner.

Specifically, if a market can be freely contested, the efficiency consequences will be similar to perfect competition, irrespective of how few firms exist in the industry:

- firms in the industry will earn normal profits in the long-run;
- all monopoly profits are eliminated so as to make new entry unattractive; and
- firms in the industry have an incentive to be technically

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1. A more detailed description of the theory of contestable markets, and its application to the US airline industry, is presented in Appendix VIII.

efficient as any production inefficiencies would be an invitation to new firms to enter the market.

Of course absolutely unrestricted entry and costless exit is, like perfect competition, only an ideal which is unlikely to be achieved in practice. However, proponents of contestability theory argue that reductions in barriers to entry and exit in real world industries, to make markets more contestable, will still yield steady improvements in industry performance and behaviour.

The removal of restrictions on entry to a market is a generally accepted method of improving efficiency and is implied in the brief discussion on industry structures above. However, the novel elements of contestability theory are claimed to be the emphasis on the freedom of exit from an industry and the demonstration that potential entry can force the incumbents of an industry to behave in a competitive fashion. The theory has thus been deemed particularly apt for markets tending towards natural monopoly whereby an efficient outcome can be obtained, providing any barriers to entry and exit are eliminated (or overcome) by government action.

THE AIRLINE INDUSTRY IN A THEORETICAL FRAMEWORK

This section considers whether any of the above theories can adequately explain the current situation in the domestic trunk airline industry, and the usefulness of the theoretical models in explaining possible behaviour in the industry.

The Australian domestic trunk airline industry possesses the following market characteristics:

- The number of firms is small. TAA and Ansett control major trunk services although East-West Airlines operates on some routes.
- The limited number of firms (coupled with restrictions on entry) gives the individual operators the potential for some degree of control over price and output (although government regulation restricts this control).
- The product offered by the airlines is differentiated and indeed is a complex mix of price and service combinations. Some of the outputs are largely joint products; for example, the carriage of freight and passengers on passenger aircraft.
- There are almost complete barriers to outside competition (from international carriers, regional and commuter services and new airlines).

- Price competition is largely controlled. TAA and Ansett must offer the same economy fares although they may offer different discount fares.
- Non-price competition between firms in the industry occurs in the form of advertising, parallel scheduling and in-flight and ground service.
- Collusion is permitted in the interests of promoting capacity utilisation.

The type of theoretical market structure most closely resembling these characteristics is some form of collusive oligopoly. More specifically, the domestic airline industry could be described as a differentiated oligopoly where the products are very good substitutes for each other. Restrictions on price competition result in substantial non-price competition, aimed at maintaining market shares or gaining an 'edge'. Government supported barriers to entry are normally compatible with a high degree of collusion and the behaviour of the two dominant airlines suggests that the industry can be classified as a government-enforced cartel.

Some of the economic effects of oligopoly were discussed above. The characterisation of the domestic trunk airline industry as a collusive oligopoly suggests, in fact, that it would operate like a monopoly in many ways. The following economic effects would be expected from a collusive oligopoly:

- lower output levels and higher prices compared with more competitive markets;
- the possibility of long-run pure profits for the airlines, which suggests that customers pay more for services than is necessary to hold resources in the airline industry;
- the possibility of monopoly factor rents being reaped by other factors of supply;
- there is no automatic tendency for firms to produce where long-run average costs are minimised;
- the lack of price competition may encourage firms to compete more on the basis of non-price competition, for example, frequency of services;
- the possibility exists of economic waste from high expenditure on sales promotion;
- consumers may not be provided with sufficient variations in the

types and qualities of products, thus providing insufficient scope for expenditure to be allocated so that it follows individual tastes and preferences; and

- there is the possibility of a greater amount of technical innovation than would occur in a more competitive industry (although this is a contentious issue).

Some of these characteristics were identified in the analysis of trunk airline performance presented in Chapter 3.

In effect the current market structure on the domestic trunk routes means that the airlines would be expected to attempt to operate as monopolists, setting prices as high as possible in each market segment and erecting the firmest possible fences to prevent each segment from benefiting from the lower prices offered to other segments. The airlines' concern would be to maximise their own return by exploiting their ability to segment the market (without fear of being undercut by new entrants).

Little consideration has been given in this discussion to the dynamic elements in an economy that help shape market structure and may help justify the current airline industry structure. The remainder of this chapter describes these elements.

DETERMINANTS OF INDUSTRY STRUCTURE

There are a variety of factors that might determine industry structure. These include:

- economies of scale
- barriers to entry
- desire and ability of firms to gain market power
- impact of government policies.

Economies of scale

A long established economic principle is that the technological conditions governing the operation of the production process in most industries result in a firm's long-run average cost of production falling as output increases. Decreasing long-run average costs for larger output and scales of operation is referred to as 'economies of scale'. Economies of scale are caused by factors such as the increasing specialisation of labour and the increasing use of advanced technology and/or large, complex plant and equipment.

Economies of scale occur up to that plant size where average cost eventually reaches a minimum point (or stops decreasing as output increases). At still larger sizes of plant, average costs may rise again (diseconomies of scale). The extent of economies of scale will obviously vary between industries (and between firms in the same industry) depending on the nature of technology and types of production technique employed.

The desire of firms to achieve maximum technical efficiency by fully realising scale economies can lead to a high level of concentration in an industry. Whether or not this occurs in a particular industry will depend largely on two factors: the size of the optimum scale of plant, and the size of the market.

If economies of scale are very large at the plant level relative to the size of the total industry market, the optimal plant size may result in only a few firms existing in the industry. Alternatively, economies of scale may still be important in an industry but because the industry's market is so large a relatively competitive industrial structure may still be possible.

Where economies of scale are not important in an industry there is a greater likelihood of more competition, although this will still depend to some extent on the size of the market.

Economies of scope

A complement to economies of scale, the concept of 'economies of scope', measures the cost advantages to firms of providing a range of products and arises from the joint utilisation of resources. In such circumstances cost functions may exhibit both a form of economies of scale and of complementarity in production. Thus, economies of scope are said to exist in an industry when a single firm can produce a certain level of output for each product at a lower cost than could a combination of separate firms, each producing a single product.

Natural monopoly

In an extreme case, economies of scale may create what is termed a 'natural' monopoly[1] by requiring a scale of operation so large that it can cater for the market's total demand. A natural monopoly exists

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1. The term natural monopoly simply implies that the natural result of market forces is the development, in the longer term, of a monopoly. Decreasing costs over the entire range of output for the market will result in large firms prospering at the expense of small firms until only a single firm remains.

when the minimum long-run average cost of production occurs at a rate of output sufficient (or more than sufficient) to supply the entire market. Therefore, the full advantages of large scale production can only be gained from a firm whose capacity equals or exceeds the total economy's demand for that industry's product, such that the cost of producing the industry's output is lower when undertaken by a single firm than by two or more firms. In cases where a single firm is allowed to operate a natural monopoly, the firm can effectively block the entry of other firms for technological reasons, as potential entrants face the prospect of continuing losses because they cannot achieve the low production costs of the incumbent firm. Common examples of natural monopolies are public utilities concerned with telephone and electricity supply.

The significance of economies of scale in an industry should be treated with caution. On the one hand, if it can be shown that scale economies are important enough to suggest a natural monopoly could develop in an industry, then some form of regulation would appear necessary. Regulation in this case would be justified in the interests of controlling the monopoly and protecting consumers from exploitation[1], unless the industry is operating in a contestable market (and provided that the theory of contestable markets is accepted)[2].

On the other hand in industries where firms produce more than one product or serve more than one market, the mere existence of significant economies of scale may, in itself, suggest little about the presence of a natural monopoly. In addition, where a natural monopoly does appear to exist in a multi-product firm, this may not necessarily be the case for all of its products.

Barriers to entry

Various factors may act as an effective deterrent to new firms entering an industry with obvious implications for market structure. The major barriers to entry are economies of scale, sunk costs, product differentiation, government enforced or supported barriers, resource constraints, absolute cost advantages and the level of risk.

Economies of scale

It was noted above that the existence of scale economies in an

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1. The regulation of natural monopolies is discussed in Chapter 5.
2. The ability of even a 'natural' monopoly to exploit its market position is questioned by proponents of contestable markets theory. See Appendix VIII.

industry may serve as a natural barrier to entry. This can occur where the minimum efficient size of the firm is large in relation to the size of the market and where there is a considerable cost disadvantage in operating firms of a smaller size.

Sunk costs

If the large fixed costs associated with some industries also happen to be 'sunk' costs, then this will constitute an entry barrier to new firms (and an exit barrier to incumbent firms). Sunk costs are costs which must be borne by a potential entrant, but which do not have to be paid by incumbent firms again. Sunk costs represent assets that have little value in alternative uses. In addition, incumbent firms may have the advantage of being able to ignore sunk costs in any potential price war with new entrants.

Product differentiation

An industry's product may become so closely identified with particular firms' names that buyers will be reluctant to purchase other brands. In fact, the barrier to entry in this case is often the sales promotion activities of firms to support differentiated products rather than the product differentiation itself.

Government enforced barriers

Government related barriers to entry exist in many industries and particularly in transport. The granting of an exclusive franchise, patents or even copyrights may serve as very effective entry barriers. In addition, government legislation in many industries has an important impact on industry structure.

Resource constraints

A barrier to entry may exist when there is a shortage of highly skilled personnel and/or other important resources. In addition there may exist restricted access to common industry infrastructure or facilities.

Absolute cost advantages

In some industries existing firms may have superior production techniques maintained by patent rights or have control of inputs essential for the production process.

Level of risk

Some industries are naturally more risky than others and this may deter entrepreneurs from investing their capital. Examples of the type of risks facing potential entrants are the volatility of demand in the industry and the possibility of predatory pricing practices by

incumbent firms. Risk-taking must be accounted for by a firm about to undertake production in a certain industry and rational entrepreneurs will not take risks unless they expect to receive adequate remuneration in return. If the level of risk in a particular industry is perceived by potential entrants to be very high in relation to the expected return on investment, the risk factor may form an entry barrier.

In general, in industries where substantial barriers to entry are prevalent, product prices can be maintained above the level that would yield a normal rate of return without attracting entry, thus allowing monopoly profits to occur. Therefore, barriers to new competition are inconsistent with economic efficiency.

Desire and ability of firms to gain market power

A third major determinant of industry structure is the desire and ability of business enterprises to gain market power. Market power confers on its owner the means of earning high profits. The inducement to monopolise markets may not come from a desire for increased efficiency; rather, the aim may be to gain (or keep control of) a market in order to earn monopoly profits.

The opportunity for firms to gain market power is most often provided by the two major determinants of market structure discussed above, namely economies of scale and barriers to entry. Thus if the minimum efficient size of a firm in a particular industry is very large, incumbent firms may be able to increase their market power by expanding at the expense of smaller firms. In addition, of course, firms are generally only able to gain market power if substantial barriers to entry exist.

The means by which firms in an industry gain market power are through natural expansion of the firm, by takeovers or mergers, and by the formation of industry cartels or collusive agreements. In all cases the economic effects are much the same, resulting in restrictions on output or sales and lack of price competition.

Impact of government policies

Governments can influence industry structures in two important ways; firstly, as the framer of the legal and economic environment within which business operates, and, secondly, as the largest single buyer of a nation's output.

Government controls might take the form of promoting the

rationalisation or standardisation of production, erecting barriers to entry (for example, by offering selected subsidies, loans, or franchises), price controls and the promotion of competition. All these measures may have the effect of influencing concentration in an industry.

Government expenditure on goods and services has both direct and indirect effects on the structure of a particular industry. Directly, the main effect is through the awarding of government contracts, whereas the indirect effects include the encouragement of technical change.

APPLICATION OF THEORY TO THE AIRLINE INDUSTRY

The discussion above has sought to examine the major factors that shape the structure of modern industries. Such factors are influential in determining the number and size of firms in an industry and thus traditionally have been seen as having an influence on efficiency consequences. (Contestability theory, in contrast, places little emphasis on the number of firms in an industry.)

The factors that shape the structure of industries are such that modern western economies are, for the most part, characterised by either oligopoly or monopolistic competition. The form of market structure which prevails in a particular industry depends upon whether the balance of factors pushes towards high or low concentration.

Earlier in this chapter it was concluded that the Australian domestic airline industry could be currently categorised as a form of oligopoly. This means that it might be expected to demonstrate some of the economic effects associated with oligopolies.

The economic theory discussed in this chapter indicates that four broad types of airline industry structure could emerge following de-regulation. These are natural monopoly, duopoly (in a similar form to the present), oligopoly (with more firms than at present and with greater competition) and monopolistic competition. Having considered the main factors that determine industry structure the following questions are pertinent to an assessment of how the airline industry might change if it were to operate without economic regulation:

- How important are economies of scale in the airline industry?
- In the absence of government regulation are barriers to entry to the airline industry high or low?

- Does the history of mergers and acquisitions in the airline industry suggest a monopoly or duopoly might emerge?
- Are there any other government policies that might influence the industry structure?

Economies of scale

One of the economic arguments often put forward by proponents of the current economic regulation of the Australian airline industry is that significant economies of scale exist in the industry and that there is a natural tendency towards monopoly.

The existence of economies of scale in airline operations is discussed in Appendix VI. In general, the evidence suggests that some economies of scale may exist with route length, load factors and networking (economies of scope). However, BTE's analysis indicates that few economies of scale exist in the operation of larger capacity aircraft (in terms of cost per available seat kilometre). This suggests that smaller capacity aircraft could compete with larger capacity aircraft on an economical basis on short distance routes.

Therefore, there is little evidence to suggest that economies of scale in relation to the size of the Australian market would allow only one or two firms to operate profitably in the industry. On the contrary, the lack of significant economies of scale would suggest that a number of firms could operate profitably on most trunk routes in the market.

Barriers to entry

In the case of the Australian domestic trunk airline industry the major barrier to entry is the one which is the most effective of all barriers: government regulation. Assuming this barrier were eliminated would there be other effective barriers to entry which would prevent some (or many) new airlines participating in the market? Possible problems to be overcome by potential entrants have been identified as economies of scale, sunk costs, the level of risk, product differentiation and resource constraints.

In general, economies of scale were not found to be of major importance in the airline industry. Consequently economies of scale may form only a minor barrier to entry.

Sunk costs in the airline industry appear to exist in the form of airline owned terminals, the provision of maintenance facilities,

sales promotion and route development costs. Another possible sunk cost may be aircraft 'positioning' costs (for example, from the US to Australia) and the costs involved in training air crew. The analysis of costs in the airline industry in Appendix VI indicated that the indirect costs of airlines (which are for the most part fixed in the short-run) account for approximately 50 per cent of operating costs. However the extent of sunk costs, while possibly significant, is much lower than 50 per cent, because most of the fixed assets of airlines (for example the aircraft) are mobile.

The level of risk in the airline industry could be considered a substantial barrier to entry, and may thus deter large capital investments. Two specific areas of concern for potential entrants might be the entrenched market position (and thus market power) of the two major airlines, and the risks associated with incurring some sunk costs. In the former case a great deal will depend on the particular sub-market a potential entrant has in prospect, while in the latter case the major concern will relate to the ease and cost of exit from the industry if an airline is receiving an inadequate return.

Product differentiation in the airline industry is based on differences in the quality of service offered to customers and persuasive advertising about the differing qualities (whether real or imagined) of the product offered. Little is really known about the significance of these factors.

However, a common criticism of the present airline market is that there is insufficient choice of price/service combinations to cater for the various sub-markets (particularly at the lower quality/price end of the market). The new entrants may simply have to offer price/service combinations that would match customer preferences to find market acceptance, so that product differentiation may be an 'invitation' to entry in the sense that it results in market niches available to new entrants. Thus, product differentiation would not appear to be a major entry barrier to the current market. Similarly, the amount of advertising and sales promotion expenditure currently undertaken by the two major domestic airlines may seem difficult to compete with for potential entrants. However, a modest amount of advertising to inform the market of an entrant's price/service combinations may be all that would be necessary for a successful entry into the industry.

The resource constraints facing potential entrants would appear to be low. While the establishment of a new airline that was a similar size to the current operators would be a major exercise, given the

requirements for aircraft, equipment, skilled personnel and organisation of the network, a new airline would usually have much smaller resource requirements because it would be expected to commence operations on a limited route structure.

In summary, it would appear that some barriers to entry (and exit) exist in the airline industry but, on balance, they may not be particularly high in absolute terms, or in relation to other industries in the economy.

Desire and ability of firms to gain market power

The history of the domestic airline industry in Australia has been characterised by the disappearance of the smaller airlines. The two dominant airlines, Ansett and TAA, have gradually taken over the smaller regional airlines in Australia with a view to gaining market power, preventing the emergence of rivals and to gain on-carriage of traffic.

The concentration of the airline industry has taken place in a regulated framework where the smaller airlines are restricted in their operations. Nevertheless, in an unregulated industry it is still plausible that new airlines would eventually be acquired by larger airlines, not because the industry tends towards natural monopoly but rather because of the basic instincts of modern business to gain market power and prevent the emergence of rivals. The desire of the two dominant firms in an unregulated industry would probably be to gain market power, thus creating pressures for a high level of concentration in the long-run. Therefore the airline industry, if completely deregulated with all firms free to engage in mergers and takeovers, could end up taking the form of only one or two firms exhibiting a large degree of interdependence.

Impact of government policies

Even though the legal environment may be conducive to free competition a government could still theoretically influence market power in the industry by its own expenditure on airline services, for example, by favouring a particular airline for government business. The procurement of government business through contracts can be of enormous significance to some industries. However, the importance of government sector passengers and freight to the airlines is limited. In addition, the range of possible price/quality combinations available in the various sub-markets of the airline market suggests that new entrants would be potentially able to prosper and expand without any reliance on government business.

In summary, the picture that has emerged from this discussion is that an unregulated airline industry might possess the following characteristics that would determine its structure:

- some economies of scale, but not of great significance;
- relatively low barriers to entry;
- a tendency for some firms to seek to gain market power in line with other industries in the economy; and
- an absence of specific government policies favouring a particular airline.

On this basis it can be postulated that in an unregulated Australian trunk airline industry:

- There would be a moderate number of competing firms, the number varying between different routes (or sub-markets).
- The product offered by the airlines would be differentiated with various price/quality combinations offered to different sub-markets. However, not all sub-markets would necessarily have access to the full range.
- Entry into and exit out of the industry would be relatively easy.
- Each firm would have some degree of control over its individual market, that is, over the price, quantity and quality of service offered.
- Non-price competition would probably exist in the form of sales promotion.

These characteristics suggest the structure of an unregulated airline industry would be somewhere in between oligopoly and monopolistic competition.

The economic effects, particularly the efficiency consequences, of such an unregulated industry structure are perhaps best considered in relation to the present market structure.

From a theoretical viewpoint, firms in an unregulated industry with the above characteristics would be more technically efficient than firms in the current industry situation. The greater number of firms and the relatively free entry of firms to the industry implies, in the absence of scale economies, potentially lower unit costs in the industry than currently exist. In practice a greater incentive for cost-minimisation in an unregulated industry would be expected because

in circumstances of greater competition, particularly price competition, a firm's rate of return will depend critically on cost control.

Allocative efficiency could also be expected to improve relative to the current industry structure. New entrants to the industry are likely to attempt to meet consumer preferences by offering fare/service combinations not offered by incumbents, particularly the lower fare options most likely to be used by private travellers (as described in Chapter 2). Therefore, the lower income groups in the country are likely to be better served by such an industry structure.

In general, the greater the number of firms in the industry the wider will be the choice of product/price combinations available and the greater will be the satisfaction of all consumer preferences. The free entry of firms would also be expected to restrict opportunities for long-run excess profits in the industry, thus leading to a more efficient allocation of resources.

To conclude, firms in an unregulated industry structure would, in theory, behave more efficiently in an economic sense than firms in the current industry structure. The efficiency gains would be essentially due to the ability of firms to freely enter and leave the industry and the competitive environment this creates, by way of actual competition within the market and the threat of competition from potential entrants.

CHAPTER 5-ECONOMIC RATIONALE FOR REGULATION

The previous chapter presented a discussion of the economic theory of industry structure in relation to the airline industry, with a particular emphasis on the efficiency consequences of various models compared to the competitive market situation. One of the determinants of industry structure identified was government intervention and this is discussed further here.

In the real world all industries are affected by some form of government intervention, including regulation, which for better or worse, influences the economic outcomes of individual industries. The airline industry is no exception; on the contrary it is often amongst the most heavily regulated industries in many countries.

The framework of the current economic regulation of Australian airline operations was outlined in Chapter 2 of this Paper. This chapter is concerned with the economic rationale for the regulation of an industry and its application to air transport.

Regulation is one of the main instruments available to a government for achieving particular industry policies. However, government intervention may take a number of forms, for example:

- direct controls, or regulation, affecting entry conditions, pricing and quality of products etc;
- taxes and subsidies to provide financial encouragement (or discouragement) for the production of certain goods; and
- government purchasing schemes to influence the level of production.

The most appropriate form of intervention will vary with the objective and industry in question. Thus in cases where intervention appears warranted, the particular type of intervention to be implemented also has to be justified. In general, however, taxes and subsidies are usually regarded as the preferred options because they tend to minimise distortions to resource allocation.

In the first part of this chapter, theoretical reasons for regulating an industry on the grounds of allocative efficiency, technical efficiency and equity are presented. This is followed by a discussion of some of the economic costs that may be involved when industries are regulated. In the second part of the chapter the theoretical aspects of regulation are applied to the Australian airline industry.

THE CASE FOR REGULATING AN INDUSTRY

Allocative efficiency considerations

In Chapter 4 it is noted that the most efficient allocation of resources occurs in perfectly competitive markets and that allocative efficiency generally improves as market participants behave more competitively. The perfectly competitive market that produces the most efficient outcome is rarely observed in the real world and, consequently, the allocation of resources that occurs in the great majority of industries is, to some degree, allocatively inefficient.

Markets in which resources are misallocated relative to competitive markets are referred to as examples of 'market failure' and provide a rationale for government intervention. The government's task in regulating an industry on allocative grounds is to encourage the same production of goods (in terms of quantity and quality) at the same price as would occur under competitive conditions.

There are four major areas which may provide a rationale for regulation:

- monopoly
- externalities
- other market imperfections
- second best considerations.

Monopoly

An important justification for government intervention on allocative grounds is the existence of monopoly, or other forms of excessive market power. If monopoly exists, too few resources are allocated to the industry in question, with output lower and prices higher than would occur if the industry operated under competitive conditions.

In a strict theoretical sense all types of market structure outside perfect competition contain some 'monopoly' elements and so provide a rationale for government intervention. In practice, a government can only concern itself with the most serious cases of resource

misallocation that occur in one-firm industries (monopoly), or in industries with only a few firms that collectively behave as a monopoly (collusive oligopolies).

In an industry where either a monopoly or a collusive oligopoly exists, a government may wish to intervene to try to promote more competition in the industry. A government may seek to encourage competition by using anti-trust legislation to break up one-firm industries into several independent firms, or to prevent monopolies emerging by way of mergers between large firms. Governments may also try to promote competition by reducing barriers to entry to an industry and by legislating against restrictive practices such as collusion, predatory pricing and unfair price discrimination.

A government is unlikely to wish to encourage competition in the case of a natural monopoly, but would rather attempt to control it to prevent exploitation of its market power. As noted previously, an industry may be categorised as a natural monopoly if, in the longer term, the 'natural' result of market forces is the development of a monopoly because of scale/scope economies. Concentrating production in a single plant is necessary to attain maximum economies of scale.

A natural monopoly provides a major justification for government intervention and can be controlled in a number of ways, including direct government ownership, with the rationale for intervention being the prevention of consumer exploitation. Regulation of a natural monopoly accepts that a one-firm industry should exist for technical efficiency reasons, but seeks to prevent the firm from using its monopoly power to exploit consumers by restricting output and charging high prices (allocative efficiency).

Externalities

All costs and benefits should be accounted for in the price of the product if the price system is to provide the correct signals to individuals and firms. However, there are many circumstances when the provision of a product or service results in 'side effects', the values of which are not fully reflected in the price of the product sold or the resources used. These 'side effects' or additional costs and benefits are referred to as externalities.

Examples of negative externalities are air and noise pollution. In both cases the market pricing system fails to produce an appropriate allocation of resources because the costs of air and noise pollution are divorced from the perpetrator. The firms' private (profit maximising) considerations do not reflect the costs to society as a

whole and its product is therefore 'over-produced'. Positive externalities involve activities which confer social benefits but these will be under-produced if firms respond only to private market forces.

Externalities are widespread in the economy and, if significant, provide a justification for government intervention on resource allocation grounds to seek to ensure that resources are allocated in accordance with their true valuations by society. Where a government considers public action is justified, negative externalities are generally handled by regulation to limit activities or are discouraged through taxes, whereas positive externalities are either encouraged by subsidies or catered for directly by the public provision of goods and services. The tax/subsidy response is usually preferred on efficiency grounds.

Other market imperfections

Governments may intervene in markets for other reasons consistent with the promotion of competition, by seeking to remove 'peripheral' imperfections that may prevent the market operating efficiently.

Information disparities and consumer ignorance are generally the main forms of imperfection. Efficient markets always require adequate information to operate properly. However, where market signals are not read or are misperceived by participants, there will be a different allocation of resources than would have occured if consumers had greater knowledge about various products and markets.

The government has two roles in this regard: to provide information where it is otherwise not forthcoming to help market participants make the correct choices; and to prevent participants from being misled in making their choices by, for example, safeguarding the quality of products.

The other major form of market imperfection that may justify government intervention relates to time lags, or the immobility of resources. For example, slow responses to market signals can lead to bottlenecks in production or sustained shortages. Reductions in lags inherent in the market may be achieved through appropriate government action in some cases. In the case of labour, for example, government sponsored retraining programs, or relocation allowances may result in a quicker reallocation of resources in response to market demands.

Second-best considerations

The 'theory of second best' provides a possible justification for

government intervention in an industry to offset distortions elsewhere in the economy.

The unconstrained competition of firms in a particular industry may produce less efficient results than regulated competition in situations where price and output are already distorted by the presence of other 'imperfections'. The existence of monopoly elements elsewhere in the economy (particularly in industries producing close substitutes) and industry specific taxes or subsidies, may all have the effect of misallocating resources between the industry in question and other industries in the economy. Thus goods and services might be over or under produced in the industry (relative to 'true' consumer preferences) because of price distortions caused by these influences.

The case for regulation in these circumstances is for the government to attempt to compensate for the effects of 'external' distortions on the industry and so achieve a 'second best' solution (the first best situation would occur if the causes of the distortions were eliminated).

Technical efficiency considerations

The case for government intervention on technical efficiency grounds is to ensure that the resources used in particular industries are employed as efficiently as possible; which is the same thing as saying that an industry's output should be produced at the lowest possible cost.

Efficient resource use in an industry benefits the consumer by making lower prices possible. In addition, the need for fewer resources in an industry allows additional resources to be employed in other industries in more productive uses.

There is a choice between two broad approaches for a government to adopt if it wishes to encourage technical efficiency in an industry; promoting competition or preventing the wasteful use of resources. The appropriate strategy depends upon the nature of the particular industry.

Promoting competition

In industries where economies of scale are not important, economic theory indicates that the greater the degree of competition in the industry the lower will be unit costs. This is based on the proposition that price competition places a high premium on minimising costs because firms are intent on maximising profits. Conversely, in

monopolistic industries, the absence of competitive pressure removes a great deal of the incentive for controlling costs.

There are three major aspects to competition that will encourage a more efficient use of resources:

- a large number of firms
- independent behaviour of firms
- price competition.

A possible role for a government is to help create these conditions so that competition in an industry is promoted. In most respects the appropriate policies to promote technical efficiency through competition are similar to those mentioned earlier for promoting allocative efficiency through competition. Thus, the elimination or reduction of entry barriers may allow new firms into the industry and encourage price competition, while the prevention of collusion will force firms to act independently and encourage genuine competition.

These aspects form, in fact, the basic rationale behind the general provisions in Part IV of the *Trade Practices Act 1974*.

Excess capacity

Excess capacity occurs in an industry when existing plant is not used to its full potential (that is, the maximum rate of output is not reached). Some excess capacity may occur from time to time in most industries due to short term fluctuations or planning errors, but this problem is likely to resolve itself over a short time period. In some industries, however, excess capacity can persist for lengthy time periods and may justify government intervention.

One situation where this may occur is in industries where barriers to entry allow incumbent firms to collude and charge high prices and restrict output. Formal or tacit collusion may protract the survival of capacity which is no longer (if it ever was) justified by the level of consumer demand. Collusive agreements, which hold prices above costs, may also encourage investment in excess capacity if an individual firm's sales depend in any way upon the amount of capacity it possesses (for example, cartels assigning individual firms an output quota proportional to capacity).

The consequence of long-run excess capacity in an oligopolistic industry is higher costs which can be passed on in the form of higher prices. Excess capacity resulting from collusion in oligopolistic industries may therefore justify government intervention aimed

specifically at forcing existing firms to behave independently.

A second situation where excess capacity may persist is in industries with a wide degree of product differentiation and easy entry and exit conditions (as in monopolistic competition). The excessive number of product varieties available to consumers can result in uneconomical production runs. If products were more standardised, resources could be used more efficiently and costs lowered. However, this would be at the expense of variety or convenience to the consumer and, providing the conditions exist for effective competition, government intervention is unlikely to be justified.

Non-price competition

Increased service quality and advertising, both of which are prevalent in oligopolistic industry structures, are possible sources of high costs in an industry. Increased service quality ('service inflation') may take the form of firms offering 'free' or 'better' services of various kinds, for example, installation and various extras. In reality, the costs of such services are reflected in the price of the products. 'Service inflation' and advertising may be technically inefficient because without the excessive selling or service costs the product could have been produced at a lower cost and offered to consumers at a lower price. In addition, allocative efficiency may be lacking because the 'free' services offered may be greater than demanded by many consumers who have no choice in the product price/quality package they receive.

Regulation to reduce service quality and advertising is difficult and it is often argued that it would be an unwarranted intervention in the free market. Beyond regulation designed simply to protect consumers from unsafe products and from unscrupulous suppliers, the most appropriate forms of government intervention may be ones designed to encourage the free entry of firms into the industry, price competition and greater consumer knowledge.

Prevention of wasteful resource use

In contrast to industries where technical efficiency may be improved by greater competition, some industries can obtain technical efficiency gains when the number of firms in the industry is reduced.

If the minimum efficient size of a firm's plant in an industry is reasonably large in relation to the size of the market (that is, economies of scale exist), the presence of a number of firms in the industry may result in each individual firm having a share of the market that is too small relative to its optimum scale of operation.

This situation results in 'overcrowding' in an industry. Thus, the total industry output could be produced by fewer firms at lower cost. If entry into the industry were unrestricted, exit easy and there were no collusion between firms, there would be natural forces operating to promote industry rationalistion and to move remaining firms towards long-run cost minimising output. In this respect the wasteful use of resources in an industry has many similarities to the natural monopoly concept, as in both cases the presence of economies of scale has implications for the efficient number of firms in the industry.

However, unlike natural monopoly, the wasteful use of resources in an industry may not always be self-correcting. Wasteful resource use may persist over time for the same reasons that excess capacity does: due to collusion, barriers to entry or product differentiation.

In cases where waste is the result of collusion, the most appropriate form of government intervention would be measures that allow competition to work more effectively. An important form of intervention would be one that made the entry and exit of firms easier. The threat of entry may force incumbent firms to increase their scale of operation so as to maximise cost advantages over potential entrants, while easier exit may encourage some firms to transfer resources to more efficient uses. In addition, specific measures aimed at preventing collusion, or eliminating a restrictive practice, may sometimes be necessary. Enforced rationalisation of the industry structure by government intervention to open up the market may, however, involve a trade-off with allocative efficiency, because of the reduced range of products available to consumers.

Destructive competition

Destructive competition theory asserts that excessive price competition may sometimes have extremely adverse efficiency consequences. In situations where destructive competition may occur, it is argued that some form of government intervention to stabilise the industry may be required[1].

One form of destructive competition involves industries subjected to sharp cyclical or random fluctuations in demand, costs or technology, with vigorous price competition occuring in periods following these shocks. The number of firms in such an industry may be small or

1. Destructive competition is sometimes referred to as 'excessive competition' or 'cut-throat' competition.

relatively large. The major prerequisites for destructive competition are that firms behave independently, prices are flexible, fixed or sunk costs are a large proportion of total costs and the industry is characterised by capacity which is greater than demand.

In the event of an unexpected decline in demand firms may engage in price cutting to try to increase capacity utilisation and market share. The greater fixed costs are as a component of total costs the more firms will be able to engage in short-run price cutting, by allowing prices to fall below average costs so that firms sustain short-run losses. Some firms may exit the industry but the presence of large fixed costs, which are also sunk, may in fact make it very difficult and costly for firms to close down, thus explaining their willingness to engage in cut-throat pricing and to accept a low rate of return on capital. Losses are incurred in the short-term to enable long-term survival and prevent the loss of sunk assets.

The normal competitive process allows firms to make losses and withdraw from markets. In addition, once demand is revived in the industry, firms should be able to turn losses into profits (although possibly still at a low rate of return). Therefore, market forces may eventually lead to an efficient solution in the industry, but this may be over a lengthy time period, depending on the degree of fixed and sunk costs (if assets were easily movable or adjustable in size, then structural change could be accommodated quickly). In the interim period, however, a large degree of instability may exist in the industry.

The possible justification for regulation of industries subject to destructive competition is twofold. First, the free operation of market forces creates so much uncertainty that firms are unwilling to invest adequately, particularly in technical improvements and research and development activities which would advantage consumers in the longer run. Second, destructive competition could lead to a lower quality service for consumers, that is, firms in service industries may try to reduce their losses by reducing the frequency of service, skimping on safety or by generally becoming less reliable to consumers. In addition, the uncertainty caused by wide price fluctuations may be disliked by consumers.

Industries subject to persistent destructive competition are probably rare in the real world and, in most cases, markets displaying its symptoms are simply going through a process of necessary structural change. In these cases, government intervention that prevents structural change is likely to be counter-productive in the long-run.

In addition, 'price-cutting wars' benefit the consumer to the extent that prices of products are reduced.

If a government chooses to intervene in an industry which has excessive instability and uncertainty because of apparently destructive competition, its policies would be designed to stabilise markets by reducing uncertainty and would ensure that goods or services met acceptable standards.

In the longer term, the free operation of market forces should result in the required outcome - rationalisation of the industry structure. The need for regulation of destructive competition, based on short-term instability, may thus require only short-term measures.

Equity

In the previous section government intervention and regulation were considered as being entirely concerned with economic efficiency. Another important rationale for government intervention arises from claims for the special treatment of certain sectional interests, usually irrespective of efficiency considerations.

There are four broad types of intervention on equity grounds:

- intervention designed to change the distribution of income and wealth in society;
- intervention to provide goods or services in the 'public interest';
- intervention to ensure equal prices for similar goods or services; and
- intervention to reinforce efficiency considerations.

Distribution of income and wealth

Government action to redistribute income may involve a number of different aspects. Apart from concern with the overall distribution of income, a government may also be concerned about the distribution of income among geographic regions or between age groups. Unlike resource allocation there is no one ideal income distribution which a government can be guided towards by economists or other technical advisers. The governments role nevertheless is to somehow decide how income distribution can be changed to reflect the wishes of society.

Governments can redistribute income in a number of ways. An example is regulation designed to help lower income groups by imposing maximum

interest rates on housing loans and maximum prices on the so called 'necessities of life' such as milk and bread.

Provision of goods and services

Governments may decide to change the distribution of goods and services in the economy because of some perceived inequities, for the 'benefit of the public interest'. The provision of benefits in kind is often justified by classifying them as 'merit goods'. Merit goods are commodities which are considered so important to society's well being that they should be provided free, or below cost, in order to ensure that they are available to all members of the society. The government generally provides such goods or services (or ensures they are provided by private enterprise) regardless of income and wealth considerations, geographical location, the cost of supply or the level of demand available.

Thus, society's view of equity or 'social justice' may not be based on income or wealth grounds alone, but also on the reaching of 'minimum standards' or the provision of 'basic needs' to all members of society. This argument is often applied to people living in remote areas where normal commercial criteria would result in inadequate provision of goods and services. Intervention in such cases may take a number of forms, but one way is to set the price of the 'special' service to consumers in remote areas below cost, with the government paying the difference in the form of a subsidy.

Equal prices for similar goods or services

A third equity argument for government intervention is that all consumers in a market should pay the same price for the same product (or what appears to be the same product). This concept is essentially derived from the 'horizontal equity' objective, more usually applied to public finance issues, which requires that there should be an equal treatment of equals ('equal taxation of people with equal ability to pay').

In certain industries where a nationwide service is possible and desirable, for example postal services, it may be argued that the government should intervene to ensure that persons living in more remote areas are not discriminated against by way of price, for the 'same' service as urban dwellers (even though the cost of supplying the service to different areas may vary markedly).

Reinforcement of interventions based on efficiency

Some equity considerations may reinforce government intervention based on efficiency grounds. In market situations where substantial

positive externalities exist, for example, intervention based on the existence of social benefits may coincide with society's view of distributive justice. It may also be considered to be fair or equitable for all members of a community to have a minimum standard of health care or education at little or no cost. Similarly, where market failure exists in the form of monopoly, regulation may serve to both increase output in the industry (improve resource allocation) and eliminate monopoly profits (which may be considered to have some equity advantages).

THE CASE AGAINST REGULATING AN INDUSTRY

The various costs and problems associated with regulating an industry must be balanced against the beneficial effects of regulation.

In the first instance however, the point needs to be made that there is little requirement for any regulation of an industry on economic efficiency grounds if significant inefficiency does not exist. This seemingly obvious point is, nevertheless, a vital one in that it places a great deal of economic responsibility on the regulators and the government. To justify any intervention at all on efficiency grounds, the government must adequately demonstrate that significant allocative or technical inefficiency does, in fact, exist. Furthermore, the form of regulation should be specific to the area of inefficiency so as to minimise the effect on resource allocation in other efficiently operating areas.

Assuming, however, that inefficiency characteristics are evident in an industry, or that the free operation of market forces in an industry appears to have inequitable consequences, governments have a number of matters to consider in assessing the case against regulating the industry, namely:

- loss of allocative efficiency (including second best considerations and externalities);
- loss of technical efficiency;
- equity considerations; and
- financial costs.

Loss of allocative efficiency

Second best considerations

The 'theory of second best' was mentioned in the first part of this chapter as a possible justification for a government intervening in an

industry to offset distortions elsewhere in the economy. Conversely, the theory may also be applied in support of the case against regulating an industry.

Government attempts to improve resource allocation in an industry (particularly by bringing product prices closer to relative costs) may produce a worse instead of better allocation of resources because of market failure (or distortions caused by government taxes and subsidies) in other areas of the economy. For example, government intervention in one section of the transport industry (either by forcing prices down by regulation or forcing costs up by taxation) may make overall resource allocation in the economy worse if a close substitute in another section of the transport industry continues to operate under monopoly conditions. In such circumstances consumer choice between the two products will result in distortions in resource allocation.

The problems presented by attempting 'piecemeal solutions' in economies containing many market distortions have given rise to extensive debate in the economic literature. This has centred on the question of whether any improvement in overall efficiency will be achieved by intervention in specific industries aimed at bringing prices closer to costs. Careful analysis is required, therefore, before regulation is imposed on a specific industry.

A related point concerns the nature of the 'typical' industry in the economy, or sector of the economy. If, for example, the typical industry were some form of oligopoly, it is difficult for a government to argue that regulation of a specific oligopolistic industry is required on the grounds that it represents restricted competition and a misallocation of resources. The structure of industries is determined by various factors (see Chapter 4) and if the economy produces many oligopolies, then a government may minimise the loss of inefficiency by accepting the results of market forces (providing relatively easy entry into an industry is possible), rather than trying to produce competitive conditions everywhere at possibly great cost.

Externalities and other market imperfections

The existence of externalities in an industry should not be seen as a sufficient condition for government intervention. Externalities exist in virtually every economic activity, whether by firms or individuals. The government cannot possibly hope to be able to identify all such 'side effects' in the economy.

There is a danger also that the concept of external benefits may be over-emphasised by governments which seek to intervene in an industry on social or political grounds. For example, government intervention in the pricing and output decisions of an industry may be made for social or political reasons but is rationalised on the basis of external economic benefits.

Intervening to handle negative externalities is probably more justifiable only to the extent that they can often be more easily identified and perceived to cause public resentment. Even in such obvious cases as pollution, however, the government may encourage private solutions or offer incentives rather than imposing regulations. Intervention by regulation to correct for externalities is unnecessary in many cases. Subsidies and taxes are usually a preferred option on efficiency grounds and absolute bans or controls are only justified when pricing solutions do not work.

The case for regulating an industry on consumer protection grounds is a strong one and is not generally challenged. However, it is possible that a government may, in some areas, be subject to the criticism of restricting individual choice. For example, what a government considers to be an inferior quality product may in fact be acceptable to some consumers providing the price of the product is suitable to them. Thus, a government's attempt to improve allocative efficiency in one sense may result in an off-setting loss of allocative efficiency in another.

Finally, while time lags may provide a rationale for government intervention in some markets the dynamic nature of industries may also provide a case against intervention. Thus, regulation of an industry may once have been justified but changes in industry structure may result in the underlying rationale for regulation no longer applying. For example, the introduction of new technology or the expansion of market size may eliminate scale economies in an industry. Alternatively, structural adjustments may be worked through in an industry so that regulation required for a transitional phase is no longer justifiable.

Other allocative efficiency losses

The phenomenon of regulation in industries resulting in reduced allocative efficiency is mainly associated with regulation aimed at restricting entry (to obtain the benefits from natural monopolies, and control wasteful resource use and destructive competition).

One problem that may result from such regulation is reduced price

competition. An industry with entry restricted by regulation would be expected to follow price setting behaviour similar to that of an oligopoly or a monopoly, and for much the same reasons; entry is blocked (either implicitly or explicitly) and/ or collusion occurs. Firms in an industry where entry and the rate of return are regulated will have little incentive to engage in price competition; to the extent such firms have to compete at all it will usually be in the form of non-price competition (which as noted above, may be of a 'wasteful' nature).

Another problem which is characteristic of regulated industries is their failure to cater for the different types and patterns of demand in a market. Rather than having a wide range of product price/quality combinations available (as would tend to be the case with more firms in the industry), consumers may be faced with only a limited choice. Incumbents in the industry have a lack of incentive to innovate in price/quality packages because of their protected market. The regulators of an industry could attempt to ensure that firms provided the same flexibility in pricing and quality that would result from a competitive market. The difficulty facing the regulators is that they can never exactly identify consumer demands. A regulated price, for example, that is deemed necessary to prevent wasteful resource use, may appear to benefit consumers because it should be a lower price than would prevail in the free market. However, some consumers may be prepared to pay a higher price for a higher quality product or a more frequent service.

A regulatory agency can generally only guess at the product package demanded by consumers because of the lack of information on demand elasticities and other important data. As a result the agency is unlikely to chance upon the optimal combination. Regulation to restrict entry into the industry is likely to also restrict the range of products available to consumers and deny them the price/quality innovations that could be expected from potential entrants.

A market free from intervention, where consumer sovereignty has greater influence, will meet consumer demand more precisely. A regulated industry displaying 'lack of pricing innovation, lack of service innovation, an unwillingness to take risks and a general reluctance to probe the elasticity of demand' (Kahn 1970), will represent a welfare loss to consumers and is not the type of outcome consumers would reasonably expect from more competitive markets.

A final point in relation to the loss of allocative efficiency concerns the excess profits that are allowed in some regulated

industries. This can occur when, for example, industry profits are determined by the 'target' rates of return on capital set by regulators. These profit levels may not always be excessive in absolute terms but are frequently excessive in relation to the level of business risks borne by the firm(s). Excess profits in an industry indicate that consumers desire more resources to be transferred to that industry; if resources were permitted to move into the industry, allocative efficiency would be improved.

Loss of technical efficiency

One of the purposes of regulatory bodies is to seek to ensure that firms in regulated industries produce at the lowest possible cost. However, there are a number of reasons why technical efficiency may not be maximised in a regulated environment.

It was noted in Chapter 4 that profit-maximising firms generally seek to be technically efficient, but that the incentive to minimise costs in practice is likely to be related to the degree of competition in an industry. A regulated industry with new entry barred, and which therefore displays many of the characteristics of monopolies or oligopolies, is not conducive to cost minimisation. In addition, if regulated firms are guaranteed a rate of return on capital cost control may become almost irrelevant. Any increase in costs will be passed on to customers in the form of price increases, provided increased prices do not lead to significant reductions in demand.

The cost-plus pricing approach is common in regulated industries because of lack of alternative information sources. Cost-plus pricing often allows firms to operate with wage levels in excess of 'market' rates and encourages over-capitalisation. In a more competitive situation a firm would be punished by the market if it over-compensated its labour force, or if it allocated too great a proportion of its funds to purchasing capital equipment. In a regulated environment however, it is the consumer, not the firm, that pays for the technical inefficiency because the extra costs are passed on.

Excess capacity may also develop in regulated industries as a direct consequence of regulation. Over-capitalisation may cause excess capacity and thus place pressure on costs and prices. In addition, the regulated price levels may contribute to excess capacity, or at least to its maintenance over time; if firms were to offer more lower price/ lower quality combinations much of the excess capacity may disappear.

Equity considerations

It was noted in the first section of this chapter that governments may wish to regulate an industry on equity grounds to improve the distribution of income, to provide goods and services directly to deserving cases, or to reinforce efficiency goals. A case against regulation also exists on directly opposite grounds, that is, regulation may redistribute income and wealth inappropriately and may conflict with efficiency goals.

The principal beneficiaries of much regulation are not the consumers of an industry's products but the producers. This matter has already been alluded to in the previous discussion on the loss of allocative and technical efficiency in regulated industries, by way of monopoly profits and excessive wage levels. Firms subjected to regulation are usually much better organised and have more political leverage than consumers and are sometimes able to use these advantages to persuade governments to promote their interests above and beyond what might be justified by efficiency considerations alone.

The protection of any industry generally raises the incomes of those who own resources involved in the industry. It is unlikely to always be the case that resource owners in regulated industries are 'deserving' of such an income redistribution (particularly when some of the consumers paying for the higher return will be 'poorer').

The tendency for governments to protect regulated industries is sometimes explained by the regulators being 'captured' by the industry. Regulatory bodies may be vulnerable to the rhetoric of the producers. They are often inadequately staffed, making it difficult for them to keep on top of all the industry information that should be processed if regulation is to work effectively. In addition, regulators have frequent contact with the regulated firms which encourages familiarity and may bias judgement. The capture of the regulators by an industry may also lead to price setting that benefits the producer at the expense of the consumer.

Government intervention on equity grounds may often conflict with efficiency criteria. The basic efficiency argument is that intervention based primarily on equity grounds should be imposed in a manner that minimises the resource misallocation effects. If the equity effects of a particular government policy are sufficiently favourable there may be a trade-off between efficiency and equity but in any event the efficiency implications of equity based intervention

should be carefully evaluated (as should the equity implications of inefficiency interventions).

Regulation generally has little to commend it as a tool for redistributing resources if the constraints it places on the efficient operation of markets are taken into account. Internal subsidisation (cross-subsidisation) designed, for example, to provide services to remote areas of a market, is allocatively inefficient because services are undersupplied in profitable sub-markets and oversupplied in unprofitable sub-markets. Similarly, a nationally consistent price formula is allocatively inefficient because the price of supplying a service to different areas takes no account of demand factors.

Financial costs

In addition to the many 'economic' costs that may be incurred in regulating an industry, governments must also allocate financial resources for the purposes of regulation. These include the expense of setting up regulatory agencies, the salaries of their staff and the other operating costs. Such costs represent a dead-weight loss to society and add to a government's expenditure program. Thus, the desire of a government to allocate resources more efficiently will conflict, to some extent, with its macro-economic stabilisation goal, if government expenditure restraint is critical.

Financial costs will also be incurred for regulated firms to the extent they have to provide information to the regulatory agency and managerial resources are devoted to promoting the firm's interest with the regulators.

APPLICATION OF THEORY TO THE AIRLINE INDUSTRY

The previous discussion has indicated that governments can find some justification to intervene in any industry in the economy, but that the various costs of intervention should be carefully balanced against the benefits before regulations are imposed.

It was suggested in Chapter 4 that in the absence of restraints on the number of operators and pricing, the Australian airline industry would possess certain market characteristics that would determine its 'natural' structure. The remainder of this chapter examines the natural state of the airline industry in relation to the theoretical rationale for government intervention discussed above, with a view to determining what specific intervention may be justified for the domestic airline industry on theoretical grounds. In cases where some

intervention is apparently justified, questions remain on the appropriate type of intervention required (for example, regulation, subsidies, direct provision of service) and the possible costs (economic and financial) involved.

Allocative efficiency considerations

Monopoly

One of the more common arguments put forward by advocates for regulation of the Australian domestic airline industry is that the industry has a natural tendency towards monopoly. This proposition can be tested by examining the existence of economies of scale, economies of scope and sunk costs in the industry, matters considered in Chapter 4 and Appendix VI.

Economies of scale are possible in a number of areas, namely aircraft size, route length, load factors and the number of aircraft in a firm's fleet. The consideration of airline costs in Appendix VI reveals evidence of significant economies of scale only with reference to route length and load factors. The number of aircraft operated by a firm shows some scale economies but only up to a small minimum number of aircraft. Minimal economies could be found with reference to aircraft size. This suggests that smaller aircraft can compete with larger aircraft over short distances with little cost penalty.

Economies of scope, or the economies of operating a large network of services to various markets, do appear to be important in the domestic airline industry. Declining long-run average costs are a consequence of such things as the on-carriage of passengers by the same airline across different sub-markets, the ability of an individual airline to smooth out fluctuations in demand in different sub-markets and the use of the same aircraft to meet different peak periods. A small airline however may also be able to gain these benefits by combining the appropriate sub-markets.

Sunk costs exist in the airline industry mainly in the form of airline owned terminals and the provision of maintenance facilities but do not appear to feature significantly in an individual airline's total costs. Thus, sunk costs should not be high enough to prevent firms from entering or exiting the industry, indicating that monopoly conditions are unlikely to develop.

Therefore, there is little evidence to suggest that economies of scale (or sunk costs) in the airline industry as a whole are so substantial that a natural monopoly would emerge if the industry were unregulated.

On the contrary, the existence of scale economies is relatively small compared to many other industries; small enough perhaps to provide no more than a token barrier to entry to the industry. Economies of scope suggest some benefits of large scale operation for firms wishing to operate across many sub-markets, but this does not preclude smaller firms operating efficiently in individual sub-markets of their choice. Furthermore, there is some evidence to suggest that an airline's costs may rise with the number of airports served so there may also be some diseconomies involved in having a large network (Kirby 1984). Based on the evidence presented here, it can be said that there is no natural monopoly argument for regulating the airline industry.

The nature of the industry also suggests that a collusive oligopoly is possible but unlikely. If independent behaviour were not maintained in an unregulated industry the Commonwealth Government already has powers under the *Trade Practices Act 1974* to prevent 'unfair' collusive practices, which it could apply to the airline industry if required. Thus, if some form of oligopoly emerged in an unregulated industry, the Government would already have the legislative instruments available to guard against such possible restrictive practices as cartels, mergers and price discrimination. In addition, the absence of legal restrictions on entry of firms into the industry would help promote a more competitive environment and reduce the possibility of restrictive practices by incumbent firms.

Externalities

There are four 'major' externalities associated with the airline industry that may be considered sufficiently important to justify some form of government intervention to internalise their effects: output and employment benefits, availability benefits, safety and pollution.

Good transport infrastructure in the form of an airways system that facilitates the efficient movement of goods and people may improve productivity, thereby contributing to the economic growth of the nation. The free market is unable to gain any direct compensation for these notional benefits and, as a result, insufficient resources may be devoted to the activity. However, many airline services are final demand goods rather than intermediate goods and this argument may not apply to a significant extent.

Another possible external benefit that may exist in the airline industry is the availability of a service to non-users (or very infrequent users). This argument is sometimes applied to services to more remote areas of the country. When a service is supplied to

particular areas that fails to cover its operating costs, a government may be justified in supporting the service on the grounds that non-users of the service should have the option to use the facilities whenever they wish (possibly only for emergencies). Knowing a service is available at certain times may be highly valued by members of the community, but this 'value' cannot be translated to market demand.

The question of ensuring safety is a major reason for government regulation of transport industries in general, and the airline industry is certainly vulnerable to safety concerns. Safety may be considered an externality to the extent that aircraft accidents may affect unsuspecting third parties, and because a poor safety record by one airline may have unfavourable 'confidence' implications for the whole industry.

Pollution, particularly in the form of aircraft noise, but also possibly in the form of visual intrusion, is a negative externality which mainly affects persons in the vicinity of airports.

In all of the above cases there may be justification for government intervention to some degree. Exactly what economic weight should be attached to each external effect is not usually capable of solution by reference to economic analysis and becomes a matter for judgement by government.

Nevertheless, certain observations can be made. The most convincing arguments for government intervention would almost certainly be to promote safety and to control noise pollution. The other external effects of the airline industry are more difficult to evaluate. However, if a government is contemplating intervention supporting a positive externality explicit values should be imputed for the benefits. The possibility exists that a regulator may make the wrong decisions with reference to positive externalities. Too much capacity may be provided for some sub-markets and/or prices may be set at the wrong level.

It was noted above that taxes and subsidies should generally be used wherever possible to minimise any secondary (adverse) efficiency effects. In the case of safety however, 'financial incentives' are unlikely to work sufficiently well so that regulations, as a last resort, are likely to be required.

Other market imperfections

The airline industry is in essence no different from any other industry in that consumers will benefit from maximum information about

the various services available and from protection against 'unscrupulous' operators. The provision of consumer information on safety standards of individual operators may, because of the product, be considered more relevant than in other industries. However, this could easily be achieved, in principle, through legislation requiring full disclosure of such information.

Technical efficiency considerations

Lack of competition

In the absence of significant scale economies, the greater the degree of competition in an industry the lower unit costs will be. The minimal economies of scale that appear to exist in the Australian airline industry suggests that the best way for the government to encourage technical efficiency is by allowing competition in the industry.

The natural state of the airline industry does not absolutely guarantee that the level of competition will result in costs being minimised, and there may thus be some role for the government in this regard. The essential elements the government might seek to promote are:

- a large number of competitors
- independent behaviour of firms
- competition on the basis of price/quality combinations.

These elements will be encouraged by the removal of entry and exit barriers, but specific government action may also be required in the short-term to build a pool of potential entrants and to prevent the two dominant airlines from exerting their market power on smaller airlines.

Excess capacity

On the assumption that an unregulated industry would not behave as a collusive oligopoly restricting output and raising prices, excess capacity could only occur because of product differentiation, unexpected shifts in demand or planning errors. In the case of product differentiation, it may be that a wide variety of price/quality combinations may lead to some airlines operating with under-utilised capacity. The pressure on costs and prices will, however, be restrained providing the conditions for effective competition are present. In addition, a small loss in technical efficiency will probably be compensated for by the increased allocative efficiency resulting from wider consumer choice.

Similarly, any excess capacity resulting from changes in demand or planning errors is likely to be resolved without government intervention. In fact, the nature of an unregulated airline industry would be such that excess capacity and higher costs should not persist because of the relative ease with which airlines can adjust capacity on individual routes. The low level of sunk costs means that airlines can readily adjust the size of aircraft or the frequency of service as required.

Non-price competition

Non-price competition is characteristic of many sectors of Australian industry and could be expected to be a feature of an unregulated airline industry (as it is a feature of the present industry). 'Service inflation' may however be reduced as free entry leads to a greater emphasis on price competition, and some smaller operators could be expected to utilise only a minimal (informative) amount of advertising. In any event there would not seem to be anything particularly special about the airline industry that would require specific government intervention beyond current general legislation safeguarding consumers.

Wasteful use of resources

Prevention of the wasteful use of resources is one of the main reasons for regulating transport industries. However, economies of scale in transport that may lead to inefficient resource use are generally related to vehicle size. In the case of the Australian airline industry it has already been noted that increasing returns are not evident as aircraft size increases. Such economies of scale that do exist in the industry are found elsewhere, but in any case do not appear to be large relative to other industries.

The other side of the wasteful competition hypothesis applied to the airline industry relates to the density of certain routes in the Australian market. It may be argued, for example, that while economies of scale in the industry are not absolutely large, the existence of some scale economies combined with a small sub-market for services only justifies the operation of one airline on some routes in the industry; that is 'natural monopolies' may exist in some sub-markets.

While natural monopoly conditions may be present in small sub-markets they are unlikely to persist for a sustained time period for two reasons. Firstly, where a natural monopoly exists the market will only support the operation of one airline in the long-run. In the event that two or more airlines are operating in a natural monopoly

sub-market, pressures will build up for all but one of the airlines to eventually withdraw. Secondly, a natural monopoly only exists in relation to a given type of technology and production techniques employed. Consequently, introduction by an airline of different technology to a particular sub-market may make economies of scale no longer important. In the absence of sunk costs, an airline could challenge a 'natural monopoly' on the basis that a different aircraft type would have lower costs.

It may still eventuate that some low density trunk routes are served by only one operator. However, provided that new firms are free to enter the sub-market (possibly with smaller aircraft types), the threat of competition may be sufficient to ensure the 'monopolist' does not exploit its position.

Destructive competition

The possibility may exist of competition in an unregulated airline industry being so intense as to lead to cut-throat pricing practices, chaos and instability. In the event of a collapse of demand in the industry (or a sudden change in technology) price-cutting wars and uncertainty may occur with associated costs to both producers and consumers (although consumers will benefit from lower prices). There are, however, two points to be made here against possible government regulation.

Firstly, large fluctuations are only likely to occur infrequently. Secondly, if and when such 'shocks' do occur in the industry, the free operation of market forces (allowing the shocks to work through) may be the easiest and most effective way of overcoming problems in the industry. Changes in the industry's basic demand and cost structure require consequent changes in the structure of the industry if the industry is to be efficient in the long-term. Any market subject to shocks is liable to experience a period of instability, with price fluctuations and/or firms entering and exiting the industry.

Government intervention to prevent instability may only be warranted if the airline industry was inherently liable to sustained destructive competition. This would only be the case if firms behave independently, prices were flexible, sunk costs were a large proportion of total costs and capacity were consistently greater than demand in the industry. Assuming that an unregulated industry contained independent operators engaging in price competition, the question reduces to the extent of sunk costs and capacity considerations.

The analysis of costs in the airline industry in Appendix VI suggests that indirect costs (which for the most part are fixed in the short-run) make up about half of total costs. Sunk costs of airlines however are a relatively low proportion of total costs, thus limiting the scope for individual airlines to reduce prices below average costs and engage in price wars for any length of time. The ease with which airlines can adjust capacity, due to the relative mobility of fixed assets in the airline industry, does not, in turn, support the hypothesis that the non-matching of capacity to demand would be a problem in an unregulated industry.

Destructive competition of a nature that warrants government intervention in the airline industry does not appear likely based on the available evidence. Some 'instability' may be present in the industry from time to time, but only as occurs in other industries.

Equity

The need for government intervention on equity grounds in the airline industry is most often applied to the provision of services to rural areas; a rationale encountered in most forms of 'public' transport. The difficulty is that it may be impossible for airlines to recover costs on low density routes, or alternatively, to do so implies very high air fares to rural passengers. This raises the question of whether an airline service should be provided when it is commercially 'uneconomic', and whether an existing service should be subsidised to prevent 'excessive' fares being imposed on rural consumers.

In the context of the domestic trunk airline industry this issue may have little relevance for two reasons: firstly, because there are few services involving low density routes to remote areas on the trunk network; and secondly, most services to remote areas are within the jurisdiction of State authorities. However, this issue is briefly discussed below because there may be some trunk routes where these equity considerations are relevant.

The 'basic needs' or 'minimum standards' approach is that people living in remote areas 'need' or 'deserve' an airline service to keep them in touch with city life and to provide access to services only found in more populated areas. Closely linked to this idea is the suggestion that rural dwellers have a 'right' to adequate transport facilities for the same reasons they have a right to basic education and basic health care. Consideration of the quality of service comes second to consideration of whether any service exists at all but the same type of issues are involved. A government must make a judgement

in each case using specified criteria (as is the current practice)[1].

It would appear that the two most efficient approaches available to a government if it does wish to intervene are: direct subsidies to regular airline services, or the encouragement of a lower cost service (with smaller aircraft or through charter operations) which may nevertheless require some subsidy. Apart from the relative efficiency merits of such measures compared with regulation, these approaches would have the extra benefit of being capable of targeting directly on the relevant sub-market. Nationwide regulation to protect services to the more remote areas is usually at a cost to other consumers in the airline market. In the case of the nationally consistent air fare formula, which is based on the premise that all consumers should pay an equal price for the 'same' product (for example, equal distance travelled), a misallocation of resources occurs because actual service cost and demand factors are ignored.

The provision of airline services to remote areas may also possibly be justified if people living in remote areas are 'typically' poor compared to people living in urban areas or if people in remote areas deprived of an air service (or an affordable air service) do not have access to alternative private means of transport.

It is not at all obvious that lower income groups in society will benefit from subsidised rural air services. Similarly it is not self-evident that the public subsidy of rural air services would achieve a beneficial redistribution of incomes. This is because many urban taxpayers contributing to the public subsidy could be expected to have much lower incomes than some people living in rural areas.

Equity considerations in the airline industry can always be used to provide some justification for ensuring the provision of 'uneconomic' services at reasonable prices to particular consumers simply because 'equity' means different things to different people. Where intervention on equity grounds is undertaken by a government it is suggested that the equity objectives be reconciled with efficiency criteria as much as possible by seeking to select appropriate policy instruments.

SUMMARY

In most respects the 'natural' airline industry structure conforms

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1. The current criteria are discussed in Chapter 3.

with many other industries in the economy and provides no special reasons for government intervention to promote competition and protect consumers outside the provisions of the Trade Practices Act. Government restrictions on entry to the industry cannot therefore be justified on economic efficiency grounds and may be counter-productive (the more so if all the 'costs' of regulation are added). Unrestricted entry and the promotion of competition by the government are the main requirements for improving efficiency in the industry.

The theoretical justification for direct government intervention in the airline industry thus reduces to three areas, namely: externalities, equity and consumer information requirements. In considering these three areas there is still a need for a government to be aware of the case against government intervention in specific industries and to balance all the possible costs and benefits. In addition, there is a need to examine the various types of government intervention available. Regulation is only one of many possible intervention instruments. However, because of its many possible adverse consequences, particularly on efficiency, it should generally only be used as a last resort where other, more efficient types of government intervention (for example, subsidies and taxes) are not suitable.

CHAPTER 6-THE REFORM OF ECONOMIC REGULATION IN AUSTRALIA

The previous five chapters of this submission have examined:

- the definition of the public interest;
- the structure of the domestic aviation industry, in terms of the regulatory framework, demand and supply characteristics, and inter-modal competition;
- the performance of the airline industry in terms of meeting the public interest;
- the theoretical framework for determining industry structure; and
- reasons why governments might wish to intervene in an industry, particularly by way of regulation.

In relation to the Terms of Reference of the Independent Review of Economic Regulation of Domestic Aviation (see Appendix I), the submission presents a review of the existing arrangements for economic regulation, and provides a framework for the examination of possible options for the future. The purpose of this chapter is to focus on the form that the future arrangements for economic regulation might take.

The Independent Review is required to have regard to, inter alia, the public interest, and this is defined in Chapter 1 as including:

- safety
- technical efficiency
- allocative efficiency
- equity.

The particular emphasis in this submission is on technical and allocative efficiency. However, it is recognised that the maintenance of adequate safety standards is of critical importance for the public interest.

This chapter commences with a summary of the review of airline

industry performance presented in earlier chapters. The options for improving performance are then considered in relation to the theoretical framework, and the option most likely to achieve the required improvement is identified.

PERFORMANCE

The discussion in Chapters 2 and 3 has drawn attention to a number of areas where the air transport sector has performed well. These include:

- an excellent safety record;
- a wide variety of fare/service combinations, although the range of combinations may not represent optimal allocative efficiency as the extent of latent demand is not known;
- standard economy fares that are at similar levels to those of US airlines (provided recent fares and exchange rates are used in the comparison); and
- high load factors and reasonable aircraft utilisation.

The airlines have probably achieved some of the general objectives originally set when the two airline policy was first introduced. These include steady long-term growth[1], reliability, relative stability and the use of modern aircraft. However, it is not clear that these objectives are compatible with a high level of technical and allocative efficiency, and it is likely that the achievements have involved substantial costs. Relative stability, to take an example, may lead to allocative inefficiency because it is obtained at the expense of innovation.

There are other structural features which may be in the public interest. These include the nationally consistent fare formula, which may be seen as serving equity goals (depending on the definition of equity objectives). The airlines have demonstrated some flexibility in their operations by withdrawing from low density routes, operating different fleets of aircraft, and leasing surplus capacity overseas. This flexibility should have helped to keep costs down. It can also be argued that the existing regulatory structure has encouraged some degree of competition between Ansett and TAA at a superficial level, and from East-West Airlines on prescribed routes and specialised

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1. The downturn in the early 1980s appears to be exceptional, and the airline market is expected to continue to grow for the rest of this century.

services. Finally, the evidence suggests that the airlines have had a better than average industrial relations record in recent years despite a signficant reduction in airline employment in 1982.

Thus the airlines have performed well from a public interest viewpoint in some areas. However, a number of areas of concern have been identified and it is possible that these may be a consequence of the current regulatory arrangements. The concerns include:

- fare setting, which for economy fares is cost based and therefore not conducive to either technical efficiency (because of the scope for padding of costs provided by the cost plus method) or allocative efficiency (because it does not take account of demand factors);
- notwithstanding the similar levels of standard economy fares, and recognising the difficulties in making international comparisons, average fares, measured in terms of revenue per passenger kilometre, were 45 per cent higher in Australia than in the US in 1983-84, reflecting the wider range of fares in that country;
- profits are high and rising, suggesting the likelihood of monopoly factor rents to the suppliers of capital and indicating that current fare levels are too high in relation to costs;
- labour productivity (output per employee) appears to be low compared with similar sized US airlines, although improving;
- the overall cost of supplying capacity appears to be higher in Australia than in the US reflecting a number of the factors mentioned above; and
- the diversity of services and schedules may not meet passenger demands.

In most of these cases, the evidence presented is not sufficient to prove conclusively that Australian performance is inadequate. For example, it may be argued that comparisons with US airlines are not valid, though considerable care has been taken to select a group of US airlines - the short-haul national group - which is operationally closer to the Australian domestic airlines than any other group of airlines in the world. Nevertheless this evidence consistently suggests that there could be scope for a substantial improvement in performance, and consequently that the Independent Review should investigate the possibility of achieving some or all of these gains.

There are also a number of structural factors which might be expected to reduce the efficiency of the domestic airlines, but which cannot be

empirically demonstrated to result in inefficiency. For example, the regulatory environment provides some degree of protection for the trunk airlines if they make managerial errors. They are protected in particular from any significant loss of market share. They are also able to pass costs on to consumers through fare setting procedures, which means that there is not the same strong incentive to minimise costs that firms in highly competitive markets are required to respond to in order to ensure their survival.

Furthermore, the regulatory framework inevitably imposes institutional rigidities on the industry, because the underlying structure of the market is changing over time, and the framework is unable to respond to these changes. An example is the way the industry is essentially confined to two airlines operating on trunk routes, irrespective of the capacity of routes to accommodate only one or more than two airlines.

A final factor is the concentration of capacity controls on aircraft usage, while ignoring other factors of production. Thus high levels of aircraft utilisation may be achieved at the expense of the inefficient use of, for example, labour. This may also lead to airline innovation by way of adopting the latest aircraft technology rather than by way, for example, of innovative marketing strategies.

OPTIONS FOR PERFORMANCE IMPROVEMENT

From the foregoing discussion of airline performance, it is evident that there is scope for improved performance. The main areas for improvement are summarised as:

- a fare structure and price/quality options more responsive to demand factors;
- a reduction in overall fare levels in response to reduced cost levels;
- the restraint of any tendency to excessive factor rewards;
- improved labour productivity;
  and
- increased structural flexibility.

The aim of any reforms should therefore be to change the regulatory framework so that incentives for these improvements are introduced with a resulting net increase in welfare.

Increased regulation

One approach to improving the industry's performance is to formulate additional regulations to overcome the weaknesses that have been revealed in the existing regulatory framework. This might include detailed scrutiny of airline employment levels, wage and salary rates and profitability levels in order to set standards for the airlines. As with the existing controls on airline capacity, a Ministerial determination on the set standard could be made, and the airlines would be obliged to meet this standard. The legislation controlling the operation of the IAFC could be altered to require it to take less account of airline financial viability and more of consumer demands, however these might be expressed. Alternatively, the IAFC could be empowered to set direct profit and productivity standards, in addition to its existing mandate for price control of the airlines.

As a further measure, the Airlines Agreement might be modified to allow for the formal entry of a third airline to turn it into a three airline agreement. The trunk route network could be divided into three groups: high, medium and low density routes. All three airlines would be permitted to compete on high density routes, but only TAA and Ansett would operate on medium density routes. Low density routes would be served by one airline only, or by two airlines operating a co-ordinated, integrated service. In this way, the structure of the industry might be brought closer to the number of airlines that each route could accommodate.

This 'more regulation' approach has its own shortcomings as a solution to the question of performance improvement. Essentially, it involves much more detailed control of the industry by regulatory bodies such as the IAFC, the Department of Aviation or some newly formed aviation regulation agency. It would impose higher costs on the taxpayer to fund the staffing of the regulatory bodies. The airlines also would be obliged to supply much more data and to spend time and effort in defending their interests when standards are set. It would be important for considerably more airline cost and operational information to be provided in the public domain to permit public scrutiny of airline activities. The airlines would lose more of their business independence, as more decisions would be made by the regulator and fewer by the airlines themselves. In effect, the exposure of the airlines to business risks would be reduced further and protection from the consequences of business decisions would be increased.

The 'more regulation' approach has a more fundamental fault, as

the working of the incentives built into the system is in the wrong direction. In a highly regulated environment, the incentives for the airlines are towards the manipulation of the regulatory arrangements to maximise their return. Airlines would be concerned with defending their interests and with lobbying to ensure that any discretionary decisions within the framework do not disadvantage them. Their prime concern is unlikely to be with economic efficiency, because the competitive pressures for efficiency will be severely constrained by the regulatory arrangements. As pointed out in Chapter 5, the regulatory measures may in fact have the opposite effects to those intended because:

- the incentives are not working in the right directions;
- where regulatory bodies have discretionary powers, it is unlikely that they will chance upon an optimal solution, particularly given the problems with obtaining accurate data and measuring and interpreting critical factors; and
- where the regulatory framework is fixed, it is inevitable that rigidities will arise as markets develop and change.

Although greater regulation would be aimed at improving technical and allocative efficiency, the reasons why this is unlikely to actually happen were presented in Chapter 5. In short, the 'more regulation' approach may well not achieve the required improvement in efficiency and may make things worse in the long-term.

Deregulation

The alternative regulatory option to the 'more regulation' approach is the 'deregulation' approach.

In Chapter 4, where the theory of industry structure is briefly described, it is suggested that perfect competition is the most efficient market structure. Contestable market theory and the concept of workable competition indicate that most of the efficiency consequences of perfect competition can be approached, if not actually achieved, without being constrained by the highly restrictive conditions underlying perfect competition.

The key to gaining these efficiency benefits is the allowance of competition, or the threat of competition, in the domestic airline industry. The stimulus of competition provides the incentive to promote both technical and allocative efficiency by minimising costs and meeting consumer demands.

The absence of regulation may allow a competitive or contestable trunk airline market structure to emerge in a way that current regulations on entry, capacity and price prevent. Thus, deregulation would lead to increased technical and allocative efficiency by allowing competitive market forces to operate to maximum effect.

In practical terms, this would require the termination of the Airlines Agreement and the repeal of the Airlines Equipment Act. There would be no role for the IAFC. In essence, there would be no control over entry, capacity, prices, and the importation of aircraft specifically for the aviation industry. Decisions about these matters would be left entirely to the market place. However, the airlines would still be subject to the general business regulatory framework that applies in Australia.

An economic argument for safety regulation can be mounted in terms of externalities and consumer protection. In fact, few people are likely to argue with the need for safety regulation.

The deregulation approach has been put into effect in the US and that experience has been examined in a separate BTE study (Starr 1985a). In summary, the experience demonstrates:

- increased competition on many routes;
- lower costs and improved efficiency;
- lower overall fares on a system wide basis, notably on long and high density routes, but higher fares on short, low density routes;
- greater variety of fare/service combinations;
- improved labour productivity;
- no deterioration in safety levels;
- variable profit record for airlines; and
- reduction in service levels on some routes and improvements on others.

It is notable that many of the improvements are the same ones that are sought from a reform of Australian regulation. However it should be noted that the regulatory environment in the US was different prior to deregulation to that now prevailing in Australia, so not all of these changes may occur if deregulation is pursued in Australia. There are also market, operational and institutional differences between the US

and Australia and these may have some impact on the extent to which the US experience with deregulation is relevant in Australia.

Although the impetus for deregulation in the US came from traditional economic theory on barriers to entry, it is strongly supported by the theory of contestable markets. The important factors in this theory are the existence of sunk costs and barriers to entry, not the size of the industry or economies of scale. Accordingly, if the fundamental cost structure of airline markets meets the conditions of contestability, the theory will apply in Australia as well as it does in the US. This provides good reason to suggest that many of the benefits enjoyed in the US as a result of the deregulation of airline markets might be available to travellers in Australia.

Thus economic theory provides justification for deregulation, and the US experience provides practical support for this approach as the means by which economic efficiency can be improved without prejudicing airline safety. The key element in promoting competition is unrestricted entry to the market and to each route in the market. Contestable market theory also advances the importance of the freedom to withdraw from the market and the elimination or avoidance of sunk costs. As noted in Chapters 4 and 5, the evidence suggests that, in the absence of government-promoted restrictions, economies of scale, sunk costs and other barriers to entry are not significant in the airline industry.

The experience with an unregulated market in an Australian environment has been examined by Starrs and Starkie (1983). Their analysis of the South Australian intrastate airline market showed that the market produced a number of features beneficial to air travellers, including:

- a large increase in service frequency;
- a better range of departure times; and
- a more diverse structure of fares.

Airlines have shown some flexibility in adjusting schedules and capacity to meet consumers demands, so that there is no evidence that increased competition has produced excess capacity.

Starrs and Starkie also note that there has been no marked increase in patronage levels. One possible explanation of this is that the beneficial features noted above have been offset by the lower standard of aircraft used by new entrants (commuter aircraft rather than F27s) and this may be seen by passengers as an unfavourable feature.

Finally Starrs and Starkie conclude that the South Australian market has behaved in a manner that is broadly consistent with contestable market theory.

The principle benefits that the Australian public might expect to see from deregulation include:

- improved airline technical efficiency leading to lower costs;
- wider availability of discount fares and a reduction in the conditions attached to discount fares, which would particularly benefit non-business travellers;
- innovative marketing strategies, including holiday charters, walk-on shuttle services, and low fare/low service flights similar to those available in the US; and
- services that are more flexible, and can be better adapted to changing consumer demands, as new entrant airlines attempt to find market niches not covered by existing operators.

However, while the objective of deregulation may be the promotion of competition, it is possible to identify some potential problems resulting from this approach. These include:

- the possibility of no new entrants appearing;
- the domination of the industry by one of the incumbent airlines;
- the possibility of wasteful use of resources and lower load factors;
- the possibility of destructive competition;
- greater volatility in the industry;
- decline in service quality and/or higher fares on some routes; and
- inability to fully satisfy equity objectives.

It is possible that no new entrants would appear in the deregulated market. TAA and Ansett already dominate the airline market, and potential new entrants may consider it to be too risky to challenge this market power. Further, the two trunk airlines own all of the existing regional airlines except East-West, thus restricting the size of any pool of potential new entrants. This situation would be exacerbated if one of the existing airlines followed a deliberate strategy of buying up potential competitors, in order to dominate the deregulated industry. The same objective could also be achieved by a strategy of predatory pricing, aggressive expansion of capacity, and

the acceptance of short-term losses in return for the possible long-term profits from market domination. Thus, an important factor in the early success of a deregulated industry is the existence of a pool of potential new entrants, and the availability of expertise and aircraft in firms other than TAA and Ansett.

It is unlikely that new entrant airlines would immediately attempt to directly challenge incumbent airlines on a network-wide basis. A more succcessful strategy is likely to be one of exploiting market niches left uncovered by the incumbent airlines, using different aircraft and innovative pricing/service strategies. However, new entrants in a deregulated market may still be vulnerable to the market power of incumbents.

Wasteful use of resources in the form of over supply of capacity and low load factors may well occur in the short-term on deregulated routes. However, such surplus capacity is unlikely to persist for long periods as entry and exit costs are minimal and aircraft size can be readily changed. If new entry results in over-capacity on a route, incumbent airlines should be able to adjust their capacity, by using smaller aircraft or offering reduced frequencies, or by withdrawing from the route relatively quickly.

It is also possible that destructive competition might occur in a deregulated airline industry, because of unexpected changes in supply or demand conditions. Destructive competition is only likely to occur in situations where structural change in the industry is required. These changes will be achieved quickly and with minimum long-term dislocation to services if there is no interference in the market, either by the government or by way of collusion among airlines. Airlines must adapt to the fundamental market changes sooner or later, and the long-term viability of the airline industry is probably better served if the adaptation is achieved sooner. It should also be noted that the low fares that are a part of destructive competition provide benefits for consumers that offset the losses made by the airlines.

A deregulated industry may result in greater volatility, at least in its initial phases. New entrants, and incumbents attempting to protect their positions, would experiment with innovative fares and services in order to identify viable market niches. Inevitably, some of these experiments would fail, and fares and services would then be withdrawn. Profits in the first few years of deregulation may be low as a result of this volatility, but as airlines begin to understand more about their market there should be increased stability in the industry.

Deregulation in the US has been accompanied by reduced service levels for some communities. There has been a reduction in frequency of direct services, some communities have lost services altogether, and different aircraft have been introduced on some routes[1]. As noted in Chapter 2, this trend is already occurring in Australia, as the trunk airlines withdraw from regional routes and regional airlines allow commuter airlines to take over their low density routes. This would appear to be part of the adjustment process in the aviation industry in response to changes in the fundamental supply and demand characteristics of the market. The advantage of deregulation is that these adjustments should occur faster, and more precisely in accordance with consumer demands, than in the current regulatory environment.

While the existing tools for achieving equity aims may no longer be available, alternative methods are discussed later in this chapter.

It is evident from this discussion that there are a number of strong arguments on efficiency grounds in favour of deregulation. This approach is more likely to achieve the required performance improvements than either the retention of the existing regulatory framework approach, or the adoption of the 'more regulation' approach. Such a conclusion is supported by theoretical considerations and by an examination of the US and South Australian experience with deregulation. However, it is possible to identify some potential transitional problems with the deregulation approach, which suggests that there may be a case for some form of regulation, at least in the short-term, to overcome them.

Reformed regulation

It is apparent that moving directly to a completely deregulated environment is not without difficulties. Some form of regulation may be required with the essential objective of promoting competition and restraining the abuse of market power, at least during the period of transition from the current regulatory environment. The form of regulation needs to be directed at alleviating specific problems without losing the basic incentives that work to increase technical and allocative efficiency.

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1. Simply changing the size of the aircraft does not necessarily mean a reduction in the level of service. A smaller aircraft (say an F27 rather than a jet) is likely to provide a more frequent service, possibly at more convenient times, which may represent a net improvement in service levels.

The fundamental objective of the reformed regulation scenario remains that of the deregulation option - to promote improved economic efficiency by encouraging greater competition. The key element of the general strategy for encouraging more competition is the elimination of all barriers to entry where possible. Government policies to minimise the impact of sunk costs and the absence of any restriction on airlines withdrawing from markets are also important aspects. A limited program of regulation would be justified on the grounds of promoting competition and providing for externalities and equity considerations.

The main elements of a regulatory reform strategy might include:

- removal of legislative entry barriers to the airline industry, as the essential element in promoting competition;
- no restrictions on airlines leaving markets;
- government policies to minimise the impact of sunk costs, particularly at terminals and congested airports;
- regulation to promote competition, to prevent the abuse of market power, and to promote consumer protection, as for other industries under the Trade Practices Act;
- appropriate regulation to promote safety and control noise pollution;
- as a transitional measure, a form of price monitoring and provisions to discourage predatory pricing, and sole operators of low density routes from exploiting their market position;
- measures to meet clearly identified equity objectives; and
- some measures may also be required to ensure that TAA and Ansett cannot use the dominant position they now have because of the current regulations to compete unfairly in the transitional period of reform.

It is the removal of entry barriers to the airline industry that is the critical factor in ensuring that the benefits from deregulation can still be achieved. Thus airline consumers might expect to observe improved airline technical efficiency, wider availability of discount fares, innovative airline marketing strategies and more flexible and responsive services.

Such a regulatory framework would provide no justification for an Airlines Agreement, nor for controls on aircraft imports or capacity.

There may still be a short-term role for an IAFC or similar body to monitor prices and identify unfair pricing practices[1].

There would be no specific predetermined roles for East-West Airlines, commuter airlines, charter operators or Qantas[2]; all would be free to enter the airline market and operate on interstate routes.

This regulatory reform strategy would only apply to interstate air travel[3], and each State would continue to be able to regulate its intrastate air services to suit its own purposes. The interstate airlines would not be prevented from operating on intrastate routes in accordance with State regulations. However, the introduction of the reform package to interstate services might create pressures for the reform of intrastate regulation in those States where regulations still apply because of the demonstration effect and the ability of entrepreneurs to undermine exclusive State licencing through the use of interstate services.

If any States do retain a restrictive regulatory regime for intrastate air services, it is possible that a State-based airline could expand onto interstate routes using its protected intrastate base to compete unfairly with other airlines. However, it should be noted that for such competition to be 'unfair', the intrastate airline would have to cross-subsidise interstate passengers at the expense of intrastate passengers. This would result in a welfare loss to the host State, and would be against the interests of air travellers in that State.

The strategy would also promote competition in the air freight sector, which is currently constrained by the protected dominant position of TAA and Ansett in the passenger market. Insofar as costs are reduced and a wider variety of fare/service combinations would be encouraged by competitive pressures under the reform approach, interstate tourism would be promoted.

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1. For example, pricing rules could be established by following the US pattern of a standard fare formula, with airlines able to set economy or discount fares within a zone of reasonableness around this fare.
2. Some particular provisions may be required if Qantas were to enter the domestic market in order to offset certain tax benefits available to Qantas as an international carrier and to remove any other unfair advantage Qantas may have.
3. A few of the designated trunk routes under existing regulations are intrastate routes (for example Brisbane-Townsville-Cairns). The regulatory reform approach outlined here would apply to interstate aviation, which would exclude intrastate trunk routes but include other interstate routes (for example Melbourne-Merimbula, Adelaide-Broken Hill, or Dubbo-Brisbane).

It is likely that much of the existing general business legislation may be adequate to provide the desired regulatory control of the airline industry, particularly in the areas of consumer protection and the promotion of competition. Part IV of the Trade Practices Act, from which the trunk airline industry currently appears to be exempt, covers restrictive trade practices and provides some control over mergers, monopolisation, price discrimination and similar practices. The Foreign Investment Review Board, the National Companies and Securities Commission and the Prices Surveillance Authority are also parts of general business regulation in Australia which might apply to the airline industry.

If this general business regulation is regarded as inadequate, then an alternative course of action would be the enactment of an Airline Regulatory Reform Act which would contain specific provisions to promote competition in the airline industry.

Some of the problems of moving to the less regulated framework could be alleviated by changes in policy or legislation before the existing arrangements are terminated in 1989. An early statement of government intentions would give time for potential new entrants to properly investigate the economics of new services. A pool of viable potential new entrants could also be promoted by measures which might include:

- encouragement of growth of commuter airlines by allowing them to operate larger (possibly jet) aircraft and eliminating the distinction between airline and supplementary airline licences;
- encouragement of charter operations by changing the Air Navigation Regulations to permit more frequent charter services on trunk routes and allowing charter operators to import large jet aircraft;
- discouragement of further expansion by TAA and Ansett by way of takeover of any regional or commuter operators which might be potential future competitors; and
- encouragement of 'specialised' services of a type not provided by TAA and Ansett, as provided for in the Airlines Agreement.

Such measures would appear to be feasible without directly contravening the Airlines Agreement and would have the effect of building up a pool of expertise and a fleet of aircraft outside the existing trunk airlines. Charter, regional and commuter airlines could thus form a major source of new competition for the incumbent trunk airlines.

Policies might also be changed to minimise airline exposure to sunk costs, particularly in the area of terminal costs, by promoting common-user facilities and having at least part of available terminal space subject to short-term leases. Problems of airport congestion, which might prevent new airlines from operating services to busy airports at peak periods, can be readily overcome by adopting a rational airport pricing policy. In this way, all airlines could have access, provided only that they are prepared to pay for it. All airlines wishing to use Sydney Kingsford-Smith airport in peak periods would be able to do so, and movement charges would be set to ration demand to the time slots available on a non-discriminatory basis.

Thus far, attention has been concentrated on promoting technical and allocative efficiency by way of increased competition. The importance of maintaining safety standards has also been emphasised. Equity issues have not been addressed, at least in part because of the absence of clearly defined equity objectives. However, some comments on equity consequences can be made. One likely consequence of the reformed regulation approach is a move away from a nationally consistent formula based set of air fares. Fares on routes of similar lengths might vary significantly, for some of the reasons mentioned in Chapter 3 and Appendix V. This will improve allocative efficiency, by relating fares more closely to both cost and demand factors, but may not be perceived as equitable.

It will still be possible to promote equity objectives under the reformed regulatory regime. However, the maintenance of uneconomic services will no longer be possible without direct explicit subsidies. If there is particular concern with services to specific areas in Australia, for reasons related to equity or externalities, then these could be addressed separately. The preferred approach would be to offer direct subsidies for the operation of the desired service levels to the specific areas in question.

SUMMARY

This submission has analysed the performance of the domestic airline industry and put forward alternative regulatory frameworks to improve that performance.

The strategy behind the reform of regulation is the promotion of economic efficiency and structural flexibility through increased competition. Economic theory emphasises that increased competition will not be achieved without removal of artificial barriers to entry.

The alternative of 'more regulation' is examined as a means for improving efficiency, but is rejected on the grounds that it is unlikely to actually result in the required improvement.

The alternative of full deregulation is also likely to have problems, particularly in the transitional phase from the existing regulated structure to the unregulated industry. However, US experience with deregulation does indicate that economic efficiency improvements can be achieved by reducing the extent of regulation (although it is accepted that some of the US experience may not be directly transferable to Australia).

The key feature of the regulatory reform option for Australia is the removal of entry barriers. However, regulation would still be required to maintain safety standards and to control noise pollution. This is in addition to existing general industry regulation to promote competition and prevent the abuse of market power, to promote consumer protection and to provide surveillance of prices.

Some form of price monitoring and measures to prevent unfair competition from TAA and Ansett may also be justified in the transitional phase to discourage predatory pricing and exploitation of market power. In this sense, the option is one of regulatory reform, rather than immediate full deregulation.

To the extent that any reformed regulation strategy may be judged to have adverse distributional consequences, it may be possible to compensate for these consequences by way of direct subsidies.

No practical evidence has been found to indicate that the promotion of competition by the removal of legislative barriers to entry into the domestic aviation industry would not result in improved efficiency. However, more work needs to be carried out to develop appropriate transitional mechanisms.

In relation to the Terms of Reference for the Review (as set out in Appendix I) the regulatory reform strategy would mean:

- the public interest, at least in terms of safety and efficiency, would be better served than with other regulatory options;
- there would be no specific roles for East-West Airlines, other regional airlines, commuter airlines or large aircraft charter operators: all would be able to enter the interstate airline industry;

- no controls on aircraft imports or capacity would be required;
- some form of price monitoring may be required in the inital period to prevent predatory pricing and the exploitation of low density routes;
- Qantas would be free to operate on domestic routes with provisions to offset any unfair advantage that it may have;
- the strategy falls within the powers of the Commonwealth and would apply to all interstate aviation;
- competition in the air freight sector would be encouraged;
- the strategy generally follows the overseas trend towards less regulation in North America, New Zealand and Europe;
- the wider availability of discount fares and innovative airline marketing strategies would be expected to promote interstate and international tourism;
- economic efficiency and structural flexibility would be better served by a deregulated environment in the longer term than with other options;
- there is no inconsistency with current general business regulation, although the package does rely on no weakening of the provisions of the Trade Practices Act and other general business legislation.

In summary the expected outcome following the adoption of the regulatory reform option discussed in this submission would be:

- increased structural flexibility;
- improved labour productivity;
- the restraint of any tendency to excessive factor rewards;
- a reduction in overall fare levels in response to reduced cost levels; and
- a fare structure and price/quality options more responsive to demand factors.

APPENDIX I-TERMS OF REFERENCE: INDEPENDENT REVIEW OF ECONOMIC REGULATION OF DOMESTIC AVIATION

The Terms of Reference for the Independent Review are as follows.

Recognising the Government's policy to retain TAA as a wholly Commonwealth-owned enterprise, the consultant shall:

- review existing arrangements for economic regulation of domestic aviation in Australia and report to the Government on possible options for the future;
- have regard to, and report upon the impact of, the following matters insofar as they relate to domestic aviation:
  - the public interest;
  - the role of East-West Airlines;
  - the role of other regional airlines and commuter (Supplementary Airline Licence) operators insofar as they impinge on the major trunk and regional routes;
  - import of aircraft;
  - capacity control;
  - pricing control, including public interest considerations of passing on costs;
  - access by Qantas to carriage of domestic passengers;
  - the role of large aircraft charters;
  - Commonwealth/State powers in respect of economic regulation;
  - implications for the air freight sector;
  - economic regulatory arrangements for domestic aviation in overseas countries, and any

conclusions which may be of relevance to Australia;

- Commonwealth/State/Territories tourism policies;
- the economic efficiency implications of each option; and
- the Government's proposed general review of business regulation.

. also have regard to maintaining the safety of air service operations, but shall not make recommendations on operational/safety matters; and

. undertake such other related tasks as are referred by the Minister for Aviation.

APPENDIX II-THE REGULATORY ENVIRONMENT

COMMONWEALTH REGULATION

The primary feature of the economic regulation of interstate airline operations is the two airline policy and the framework of legislation that supports it. The policy, which in essence dates back to 1952, effectively restricts competition on trunk routes in Australia to two airlines; the Commonwealth-owned Trans Australia Airlines and the privately-owned Ansett Airlines of Australia. The elements of the framework are:

- the Constitution
- Air Navigation Regulations
- *Airlines Agreement Act 1981*
- *Airlines Equipment Act 1958-1973*
- Airlines Equipment (Loan Guarantee) Acts, various years
- *Independent Air Fares Committee Act 1981*
- *Australian National Airlines Act 1945*
- Customs (Prohibited Imports) Regulations.

Each of these is described in the subsequent sections of the appendix.

The Constitution

As the aviation industry did not exist at the time the Constitution was drafted, there is no direct mention of Commonwealth powers over the industry in the Constitution. However, Commonwealth control is based essentially on Sections 51 and 122 of the Constitution, allowing the making of laws dealing with trade and commerce among the States and the external affairs power[1] respectively.

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1. For example, Australia has become a party to various international aviation treaties and conventions on flying standards and practices, rights and liabilities arising from the carriage of passengers and cargo and crimes aboard aircraft, by way of the external affairs power.

Section 92 of the Constitution, which provides that trade, commerce and intercourse between the States should be absolutely free, has also had an impact on the aviation industry. In 1945, the High Court ruled that the Commonwealth could not grant TAA an interstate air services monopoly without infringing Section 92. However, the High Court also ruled in 1965 that the power of Section 51, used to support regulations prohibiting the importation of certain aircraft, had precedence over Section 92. This decision justified the use of import restrictions as a legal device to protect the two airline policy (Poulton 1981).

More recently, East-West Airlines, the largest regional airline in Australia, sought to challenge the validity of the *Independent Air Fares Committee Act 1981* on the basis of Section 92 of the Constitution. However, the challenge did not proceed when ownership of the airline changed.

Thus the Constitution, and the High Court's interpretation of it, have tended to support Commonwealth regulation of airlines in the form of the two airline policy, although the policy has yet to be properly tested against the standards of Section 92.

The Constitution also provides for an Inter-State Commission to oversee trade between the States. However, as currently constituted, the Inter-State Commission has no powers to investigate passenger aviation matters.

Air Navigation Regulations

The aviation industry in Australia operates under the general control of the Air Navigation Regulations (ANRs). The authority for ANRs derives from the *Air Navigation Act 1920*, and is supported by a 1964 High Court decision that gives the Commonwealth the power to make its ANRs applicable to all flying operations in Australia.

At September 1983, there were 322 regulations in force, concerned primarily with the safe operation of the aviation industry and with little apparent relevance to economic regulation. There is provision in Part XIII (Air Service Operations) of the regulations for the licensing of various types of aircraft operations, including charter operations and airline (regular public transport) operations. However, the conditions for issue of licences, as set out in ANR 199, appear to provide that a licence for interstate services can only be refused on safety grounds: thus licensing provisions cannot be used to restrict entry into the airline industry.

Airlines Agreement Act 1981

The *Airlines Agreement Act 1981* gives formal approval to the Airlines Agreement negotiated between the Commonwealth Government, the privately-owned Ansett Transport Industries Ltd (operators of Ansett Airlines of Australia) and the Australian National Airlines Commission (operators of Trans Australia Airlines). The agreement was negotiated in 1980 while the Act received assent and became operational in late 1981.

The Agreement applies for a minimim of eight years, until at least early 1990. Three years notice of termination is required, and such notice cannot be given for five years after the commencement of the Agreement. Only the Commonwealth and Ansett have the right to terminate: TAA does not have this right unless it is turned into a company and then only if the Commonwealth shareholding is less than 50 per cent.

The fundamental purpose of the Agreement is summarised in Clause 6 (1)(a):

> The parties shall take all reasonable action within their powers to ensure that the Commission (that is, TAA) and the Company (that is, Ansett) are the only two operators which provide scheduled domestic passenger air services over trunk routes within Australia.

Essentially, the Commonwealth Government is obliged to act to maintain a duopoly on trunk airline routes[1] and to prevent competition by any other airlines on those routes.

However, the ban on competition from other airlines is not absolute. There is scope for competition in certain areas:

- Air freight is not subject to the 1980 Agreement, a change from earlier agreements, and is therefore available to any airline.
- The Agreement provides for so-called 'prescribed' routes[2], on which other airlines are allowed to operate services, even if the

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1. Trunk airline routes are those connecting all State and Territory capitals, plus Alice Springs, Cairns, Coolangatta, Gove, Launceston, Mackay, Mt Isa, Proserpine, Rockhampton and Townsville.
2. Prescribed routes are intrastate or regional routes and non-trunk routes in existence as at 1 July 1980.

combining of prescribed routes leads to an indirect service between trunk route centres (for example, Sydney-Albury-Melbourne or Melbourne-Mt Gambier-Adelaide).

- Other airlines may operate 'specialised' services on trunk routes, of a nature not adequately provided by TAA and Ansett, after both airlines have been given the opportunity to provide such services: however, the term 'specialised' is not defined.
- Charter passenger operations would appear to be possible on trunk routes, provided that only one flight in four weeks is provided on any route with a scheduled service (Air Navigation Regulation 197).

Thus competition for TAA and Ansett within the terms of the Agreement is provided by IPEC Aviation for air freight, and by East-West Airlines on some indirect passenger trunk routes.

Like earlier forms of the Agreement, the 1980 version allows, and in some cases requires, the airlines to consult on certain matters. Consultations are required on questions of load factors and aircraft utilisation and are permitted under the general heading of any matters affecting the efficient and economic operation of passenger air services[1].

In return for the protection afforded by the Commonwealth Government for TAA and Ansett, the airlines have entered into certain undertakings[2], including:

- submission of financial reports on trunk airline operations to Parliament each year;
- observance of airport curfew restrictions;
- acceptance of the principle of full cost recovery for airports and airways facilities;
- maintenance of all services operated at the commencement of the Agreement, and no withdrawal of services without prior consultation; and
- provision of aircraft and facilities to the Commonwealth at time of war or threat of war, with suitable compensation.

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1. Consultations concerning air fares are required to be held in the presence of members of the Independent Air Fares Committee.
2. Although not part of the Airlines Agreement, TAA and Ansett also participate in the Federal Government offsets policy.

The Commonwealth Government has also agreed not to discriminate between TAA and Ansett for government airline business, loan guarantees, import licences and in the allocation of airport facilities.

Much of the current Agreement is similar to the previous agreements, which in various forms date back to 1952 and include agreements in 1961, 1972 and 1973. The main changes compared with the most recent of these agreements include:

- the removal of air freight from the Agreement;
- increased reporting obligations for TAA and Ansett;
- some relaxation of consultation requirements;
- clearer definition of the roles of Qantas and regional airlines; and
- changes in the arrangements for dealing with air fares, by introducing the Independent Air Fares Committee.

Airlines Equipment Act 1958-1973

The basic purpose of the *Airlines Equipment Act 1958-1973*, and its subsequent amendments, is to control airline capacity provided by TAA and Ansett, and to prevent other operators from obtaining aircraft that could compete with the two trunk airlines. In this way, it underpins the two airline policy provided for in the *Airlines Agreement Act 1981*.

The Act requires the Minister to estimate future passenger traffic on trunk routes and to set the maximum aircraft capacity that TAA and Ansett can provide to each carry 50 per cent of the estimated traffic. Table II.1 shows the capacity determinations made under the Act between 1982 and 1984.

Once the Minister has made a capacity determination, the Act imposes an obligation on TAA and Ansett to supply only the prescribed capacity and, if directed, to dispose of aircraft surplus to that capacity. The two airlines are also required to obtain Ministerial approval before acquiring any new aircraft, to prevent excess capacity being supplied and to promote stability in the industry.

Prior to 1981, there was no specific provision for regional airlines to operate jet aircraft unless they were associates of the trunk airlines. However, the 1981 amendment to the Act explicitly extends control over capacity to regional airlines employing turbo-jet

aircraft, using a similar procedure to that used for trunk airlines. This provision has been applied to East-West Airlines during 1982-83 and 1983-84[1].

Regional and cargo airlines not operating jet aircraft are not subject to any restrictions on capacity or the acquisition or disposal of their aircraft.

Airlines Equipment (Loan Guarantee) Act

As part of its policy of not favouring either of the two trunk airlines, the Commonwealth makes available loan guarantees to Ansett in a similar way to those made available to TAA as a Commonwealth-owned organisation. These guarantees are incorporated in an Airlines Equipment (Loan Guarantee) Act. A number of these Acts have been

TABLE II.1-CAPACITY DETERMINATIONS, 1982 TO 1984

Capacity determination number	*Period*	*Maximum aircraft capacity (million passenger km)*[a]	*Growth (per cent)*	*Implicit load factor (per cent)*
46	1.1.82 to 30.6.82	3 329	..	73
47	1.7.82 to 31.12.82	3 363	+1.0	72
48	1.1.83 to 30.6.83	3 030	-9.9	72
49	1.7.83 to 31.12.83	2 727	-10.0	70
50	8.1.84 to 30.6.84	2 749	+0.8	70
51	8.7.84 to 31.12.84	3 007	+9.4	71

a. For each of TAA and Ansett for trunk routes.

.. not applicable

Source: Department of Aviation annual reports.

1. The other regional airlines that operate jet aircraft are associates of Ansett and are included in the capacity determinations made for Ansett.

passed since 1968, each one specifying the aircraft to be purchased, the amount of the guarantee, details of the loans and the conditions of the guarantee required to protect the financial interests of the Commonwealth. Details of the loan guarantees since 1968 are shown in Table II.2.

Independent Air Fares Committee Act 1981

One of the changes introduced at the time of the new Airlines Agreement in 1981 was the establishment of an Independent Air Fares Committee (IAFC): previously air fare increases had been approved by the Minister responsible for aviation matters. The basic purpose of the Committee is to set air fares for Ansett, TAA and other airlines. The air fare setting procedure has four elements as set out in the Act:

- cost allocation reviews to attribute costs to the flag-fall or distance components of the fares[1];
- major air fare reviews, to determine the level at which fares are set;

TABLE II.2-DETAILS OF ANSETT LOAN GUARANTEES, 1968 TO 1981

	Aircraft		*Amount guaranteed*
Year	*Type*	*Number*	*(US$ million)*
1968-73	B727	1	2.5
1969-73	B727	1	
	DC9	6	32.0
1972-73	B727-200	4	31.0
1976	B727-200	1	8.0
1977	B727-200	1	9.0
1978	B727-200	1	10.3
1978	B727-200	1	11.1
1980	B727-200	1	12.2
1981	B737	12	
	B727	4	
	B767	5	490.0

Source: Airlines Equipment (Loan Guarantee) Act, various years.

1. The Act requires that economy air fares be set on the basis of flag-fall and distance components and in practice the IAFC has developed fare formulae incorporating these components.

- minor air fare reviews[1]; and
- approval of discount air fares.

The Government policy behind the IAFC Act was outlined in the second reading speech. The intention was that fares should be set in accordance with a cost-based nationally consistent approach by use of a formula comprising a flag-fall and distance rate for the national jet network. As wide a range of discount fares as possible without increasing the burden on full-fare paying passengers was also expected. The IAFC was to set all fares in order to minimise cross-subsidisation between fare types and to ensure the maintenance of the integrity of the national trunk route formula. The Act is designed to support this air fare setting policy.

The operation of the Act and its consequences from an economic viewpoint are discussed in more detail in Chapter 3 and Appendix V. At this point it is noted that the Act ensures that TAA and Ansett both charge identical economy fares, although there is provision for different discount fares to be offered.

Australian National Airlines Act 1945

The purpose of this Act was to set up the Australian National Airlines Commission to operate the government-owned airline, Trans Australia Airlines (TAA). The original intention was that TAA would solely operate all interstate services in Australia, but following a High Court challenge in 1945 disallowing a monopoly on interstate services, TAA has operated alongside privately-owned airlines.

In 1981, the then Government passed the *Australian National Airlines Repeal Act 1981*. The purpose of the Act was to allow for the abolition of the Australian National Airlines Commission and the setting up of TAA as a public company. The new company was to take over the assets, liabilities, staff, contracts and agreements of the Australian National Airlines Commission. However, although the Act was passed by Parliament, it was never proclaimed and did not come into operation. The current Government introduced the *Australian National Airlines Commission Retention Act 1984*, which repealed the 1981 Act and effectively provided for the continuation of the status quo.

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1. Minor reviews are restricted to applications that would increase fares by no more than 5 per cent and that are justified by increases in labour costs, fuel costs or air navigation charges.

The functions of the Commission, as set out in Section 19 of the Act, are to:

- transport passengers and goods for reward by air on interstate services;
- provide aviation, land transport and engineering services to the Commonwealth and Commonwealth authorities for reward; and
- other activities, including intrastate air services, operation of hotels, operation of land transport services, and co-operative services with the Australian National Line or Australian National Railways.

Generally, the Commission is expected to run its activities on a commercial basis and this approach is re-emphasised in the 1984 Amendment Act. However, there is still considerable Ministerial and Parliamentary control over financial matters, including the commitment of new capital, the payment of dividends, the borrowing of funds, the entering of contracts, dealing in real property and the investment of surplus funds. The Commission is liable to all Commonwealth and State rates, taxes and charges, and gains no exemptions from income taxes or sales taxes.

Other legislation

The means by which the Government has prevented other potential airline operators from competing with the designated trunk airlines is the Customs (Prohibited Imports) Regulations. The regulations provide, under Section 4(2), that the importation of aircraft, airframes and aircraft engines is prohibited unless the importer has the specific written permission of the Secretary of Aviation to import the goods. Under the regulations, TAA and Ansett are permitted to import jet aircraft, but other operators are not in accordance with provisions in the Airlines Agreement. The exercise of this power to support the Agreement appears to have been endorsed by the High Court in a 1965 case brought by IPEC, who were prevented from importing aircraft to use in interstate air freight operations[1].

The trunk airline industry does not appear to be subject to Part IV of the *Trade Practices Act 1974*, which covers restrictive trade practices. Among practices controlled by Part IV are mergers, monopolisation, price discrimination, resale price maintenance,

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1. The importance of these regulations may have diminished with the 1981 amendments to the *Airlines Equipment Act 1958* which provided other means for controlling usage and acquisition of jet aircraft.

boycotts and contracts, and arrangements or understandings restricting dealings, affecting competition or related to prices. Ordinarily, the Airlines Agreement would contravene at least some of the provisions of Part IV, but because the Agreement is specifically authorised or approved by its own Act of Parliament an exception is permitted under Section 51 of the *Trade Practices Act 1974*. However, the industry is subject to Part V of the Act, relating to consumer protection.

STATE REGULATION

While the Commonwealth has the power to regulate intrastate aviation for safety and operational purposes, the authority to impose economic regulations on intrastate aviation lies with State governments.

The State governments in South Australia and Victoria impose no forms of economic regulation on airlines operating within those States. Airlines are free to enter and withdraw from markets in accordance with their own commercial decisions, provided only that they meet the safety and operational requirements of the Air Navigation Regulations and the Commonwealth Department of Aviation. However, air fares in all States for regular public transport services operated by incorporated bodies (that is, airline services) fall within the responsibility of the IAFC. For this reason, the IAFC has set air fare formulae for Kendell Airlines, which operates services in Victoria, and the Ansett associate Airlines of South Australia.

Each of the other States controls airline services to varying degrees. The form of this regulation is described in the following sections.

Queensland

The *State Transport Act 1960-81* makes provision for the licensing of air services for the carriage of passengers and/or goods within the State of Queensland. The licensing provisions apply to specific routes and terms and conditions may be set as necessary according to the public interest. Compliance with State laws relating to aircraft and their operation is required before a licence may be granted.

Airline services in Queensland are operated by Air Queensland and TAA. A number of commuter and charter operators also provide services. In June 1983, there were 123 charter licences, 5 regular licences, 13 commuter licences and 2 ambulance licences.

New South Wales

A licence under the *Air Transport Act, 1964-80* is required for an

airline to operate intrastate commercial services for the carriage of passengers and goods. These licences are issued by the State Minister for Transport on the advice of the New South Wales Air Licensing Advisory Committee and apply for specific routes and aircraft. The Act sets out a number of factors to be considered before a licence can be issued, and these factors include:

- the air transport needs of the areas to be served;
- the extent to which the needs are already being served by other air services;
- the fostering of the existence of more than one airline operating in New South Wales;
- the effect of the proposed air service on other transport modes; and
- the effect on the maintenance and orderly development of adequate air services and on the economic development or on the environment of New South Wales.

Generally, licences have been issued readily, with refusals restricted to where a proposed service would adversely affect an existing service.

Two regional airlines, Air New South Wales (an Ansett associate) and East-West Airlines, are licensed to operate a total of 19 aircraft on 25 different routes, generally to larger country towns. There are also 11 commuter airlines licensed to operate 48 aircraft on 34 different routes, generally serving smaller country towns, but also Newcastle and Wollongong.

A review of air services and regulation in New South Wales is currently under way and is due to be completed by the end of 1985.

Tasmania

The Tasmanian Transport Commission administers the *Traffic Act 1925-75*, under which licences authorising the use of aircraft are issued. The Commission may impose conditions on a licence and is required to ensure that:

- fares and freight rates are reasonable;
- wasteful competition is avoided; and
- timetables and ports of call comply with the Commission's requirements.

The main intrastate commuter operator is Airlines of Tasmania.

Western Australia

A licensing system in Western Australia is administered by the State Transport Commission under the authority of the *Transport Commission Act, 1966-1976*. Licences are issued for specific routes and applicants are required to describe the aircraft to be used, the capacity to be provided and the fares and freight rates to be charged. The criteria for a licence include:

- the necessity for the services and convenience to the public;
- the adequacy of existing services and the effect of the proposed service on existing services;
- the condition of airports and landing strips; and
- the character, qualifications and financial stability of the applicant.

Generally, long distance intrastate services are operated by the Ansett associate Ansett WA. TAA operates an intrastate service between Perth and Port Hedland as part of its Perth-Darwin service. In 1983, Skywest, a commuter operator, was licensed to provide services to a number of larger country towns in competition with Ansett WA. This was part of a general policy of allowing competition on those routes able to support more than one airline.

Northern Terrritory

The Northern Territory Department of Transport and Works administers an air service licensing system for regular public transport, charter and aerial work operations.

A one-year moratorium on the issue of new charter licences was imposed in 1981 in order to promote stability in the industry. A committee of review was subsequently established and 11 of the outstanding 26 applications were approved. In March 1983, the Northern Territory Cabinet reaffirmed that a more liberal licensing policy would be adopted. Implementation of this decision resulted in a further 16 companies receiving licences by the end of 1982-83.

Airline services in the Northern Territory were operated by Connair until 1980 when it was taken over by Northern Airlines. In 1981 the operations were transferred to Airlines of Northern Australia (an Ansett associate). Air services are also operated by a number of other companies.

APPENDIX III-DEVELOPMENTS ON SELECTED ROUTES

The discussion of market sectors in Chapter 2 concentrates on the major components of the air passenger market. However, consideration of developments on selected routes provides further useful information on trends in the market. This appendix describes several features of the 20 highest density trunk routes and the five highest density regional and commuter routes. Relevant data are presented in Tables III.1 and III.2.

TRAFFIC LEVELS

The data on passenger numbers indicate that the 20 trunk routes shown in Table III.1 generally have more traffic than the highest density regional or commuter routes. The Sydney-Melbourne and Sydney-Brisbane markets have by far the highest traffic levels, accounting for 34 per cent of all trunk passengers in 1983-84.

Traffic levels on the highest density regional services are similar to those on the lowest density trunk routes and generally higher than those of the commuter routes. However, the commuter service between Sydney and Belmont has higher traffic levels than any of the regional routes.

TRAFFIC GROWTH

The number of passengers carried on the trunk routes covered in Table III.1 generally fell over the five years to 1983-84. The decline varied from 1 per cent between Cairns and Townsville to 28 per cent between Adelaide and Perth. Economic conditions were probably the major factor causing these traffic reductions, although it seems likely that air fare changes were also important in markets such as Sydney-Canberra[1]. Traffic increased on five trunk routes, with the increase of 185 per cent on the Sydney-Perth route being particularly

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1. As the data are based on uplifts and discharges within each flight number, changes in service patterns could also affect reported traffic growth on individual routes.

TABLE III.1-CHARACTERISTICS OF 20 LARGEST TRUNK ROUTES, 1983-84

Route	Passengers: Number[a] ('000)	Passengers: 5-year change[a] (per cent)	Flights per week	Distance (kilometres)
Sydney-Melbourne	1 952	-9	306	707
Sydney-Brisbane	1 198	-5	272	747
Melbourne-Adelaide	656	-18	137	643
Sydney-Canberra	485	-20	110	237
Sydney-Adelaide	406	-15	78	1 166
Sydney-Coolangatta	383	12	148	679
Melbourne-Hobart	364	-18	166	617
Melbourne-Canberra	331	-6	88	470
Melbourne-Brisbane	327	20	99	1 376
Melbourne-Launceston	298	-13	86	476
Melbourne-Perth	296	0	47	2 707
Brisbane-Townsville	226	8	98	1 144
Brisbane-Cairns	211	16	89	1 392
Adelaide-Perth	189	-28	31	2 120
Sydney-Perth	180	185	29	3 284
Melbourne-Coolangatta	145	-20	123	1 330
Brisbane-Rockhampton	136	-9	73	520
Brisbane-Mackay	127	-13	70	799
Adelaide-Alice Springs	107	-4	28	1 316
Cairns-Townsville	85	-1	105	283

a. Based on uplifts and discharges within a particular flight number. Includes movements between airports which are not directly connected.

Sources: Department of Aviation (1984b and 1985c). Department of Transport (1981a). Various airline timetables.

TABLE III.2-CHARACTERISTICS OF FIVE LARGEST REGIONAL AND COMMUTER ROUTES, 1983-84

Route	Passengers		Flights per week	Distance (kilometres)
	Number ('000)	5-year change (per cent)		
Regional				
Perth-Karratha	99	101	28	1 250
Melbourne-Devonport	87	-3	120	412
Brisbane-Proserpine	76	126	26	898
Sydney-Tamworth	72	-8	45	319
Melbourne-Wynyard	68	-23	120	377
Commuter				
Sydney-Belmont (Newcastle)	113[a]	40[b]	81	110
Sydney-Williamtown	50[a]	22[b]	53[d]	141
Sydney-Cudal	29[a]	125[c]	na	237
Brisbane-Bundaberg	23[a]	903[c]	41[e]	290
Perth-Rottnest Island	22[a]	367[b]	19	41

a. Calendar year 1982.
b. 1978 to 1982.
c. Services did not commence until 1979. Change refers to period from 1980 to 1982.
d. Figure refers to East Coast Airlines service. Masling also operates on this route.
e. Comprises 20 by Sunstate and 21 by Air Queensland.

na not available

Sources: Department of Aviation (1981, 1982, 1984b and 1985c). Department of Transport (1981a). Various airline timetables.

notable. The increases in traffic generally occurred on the longer routes.

There was also significant diversity in traffic trends on the regional routes, with two having substantial increases and three having declines. Local conditions were probably the major influence in these markets.

The largest traffic increases on the routes covered in Table III.2 occurred on the commuter services. All of these routes had significant growth over the period to 1982 with the Brisbane-Bundaberg and Perth-Rottnest Island routes being exceptional.

There appears to be some link between route distance and traffic trends. The markets which had increases in passenger traffic over the five years to 1983-84 were generally the longer routes, although there were also examples of long distance services with significant traffic declines.

FREQUENCY

The number of flights per week on each route is significantly affected by the level of traffic. However, there is not a rigid relationship between density and frequency, and several routes such as Melbourne-Coolangatta and the two regional services to Tasmania have much higher frequencies than other markets of similar size. Service levels are probably also affected by factors such as the importance of tourist traffic, aircraft size and subsidies.

APPENDIX IV-STRUCTURE AND RECENT HISTORY OF DOMESTIC AIR FARES

An important economic dimension of competitive behaviour is the determination of price. However, in the case of the domestic airlines, much of the discretion in determining air fares is effectively removed through Commonwealth Government regulation. This is achieved primarily through the provisions of the *Independent Air Fares Committee Act 1981*, which empowers the Independent Air Fares Committee (IAFC) to review and determine passenger fares for travel on all regular public transport (RPT) air services.

The purpose of this appendix is to discuss the effect of these regulations by examining some of the characteristics of domestic air fares and recent trends in fare levels.

THE CURRENT STRUCTURE OF AUSTRALIAN DOMESTIC AIR FARES

Information on the different air fares offered by TAA, Ansett and East-West Airlines, and the conditions attached to these fares, is presented in Table IV.1.

The standard fare upon which other air fares are determined is the economy class fare offered by all three airlines. Under the Act TAA and Ansett are required to charge identical economy fares. East-West fares are calculated on the basis of a different fare formula and therefore will not be similar to fares offered by TAA and Ansett. No travel or booking conditions are attached to economy fares.

In addition to economy class fares TAA offers a business class fare which is 15 per cent more expensive than the economy class fare and, together with Ansett, offers first class fares which are 50 per cent greater than economy fares. Business and first class fares also have no conditions attached to their purchase. East-West Airlines does not offer business or first class travel options to its passengers.

The remaining air fares offered by the three airlines are discount fares. The main conditions attached to discount fares relate to booking and payment conditions and travelling requirements. These conditions make discount fares generally unsuitable for business

TABLE IV.1-AIR FARES OFFERED BY TAA, ANSETT AND EAST-WEST AIRLINES, JANUARY 1985

Fare type	*Airline offering fare*	*Premium/ discount*	*Booking and payment conditions*	*Travelling requirements*
First class	TAA, Ansett	50 per cent greater than economy fare	nil	nil
Business class	TAA	15 per cent greater than economy fare	nil	nil
Economy class	TAA, Ansett, East-West	nil	nil	nil
APEX	TAA, Ansett	35 per cent discount on return economy fare	Book and pay for forward and return journeys 30 days in advance	A minimum duration of 7 nights between forward and return journeys. Maximum duration is 12 months.
	East-West	As for TAA and Ansett	Book and pay for forward and return journeys 7 days in advance	A minimum of 3 nights between forward and return journeys

TABLE IV.1-(Cont)-AIR FARES OFFERED BY TAA, ANSETT AND EAST-WEST AIRLINES, JANUARY 1985

Fare type	*Airline offering fare*	*Premium/ discount*	*Booking and payment conditions*	*Travelling requirements*
Excursion 45 (TAA) Flexi-Fare (Ansett)	TAA, Ansett	45 per cent discount on return economy fare	Book and pay for forward and return journeys between 4 and 14 days in advance of departure. Actual flight determined by airlines on requested day of travel	A minimum duration of between 1 and 21 days between forward and return journeys
Standby	TAA, Ansett, East-West	20 per cent discount on return economy fare	No reservations, buy ticket at airport and fly when seat becomes available	nil
Group travel				
Common interest group	TAA, Ansett, East-West	10 per cent discount on return economy fare	nil	15 or more adults travelling with a common purpose. They must travel on same aircraft on the forward journey but can return individually.

TABLE IV.1-(Cont)-AIR FARES OFFERED BY TAA, ANSETT AND EAST-WEST AIRLINES, JANUARY 1985

Fare type	*Airline offering fare*	*Premium/ discount*	*Booking and payment conditions*	*Travelling requirements*
Sporting group	TAA, Ansett, East-West	15 per cent discount on return economy fare	nil	15 or more players and officials flying to or from a sporting event. They must travel together on both journeys.
Charitable group	TAA, Ansett, East-West	15 per cent discount on return economy fare	nil	15 or more adults travelling together on forward and return journeys.
Children's fares	TAA, Ansett, East-West		Not available on discount fares	nil
Child under 3 nursed by adult		No charge	nil	nil
Child under 3 occupying a seat		50 per cent of fare	nil	nil
Child 3 to 15 years		50 per cent of fare	nil	nil

TABLE IV.1-(Cont)-AIR FARES OFFERED BY TAA, ANSETT AND EAST-WEST AIRLINES, JANUARY 1985

Fare type	*Airline offering fare*	*Premium/ discount*	*Booking and payment conditions*	*Travelling requirements*
Student discounts				
Full-time secondary student 15 to 18 years	TAA, Ansett, East-West	50 per cent of fare	Not available on other discount fares	nil
Full-time tertiary student	TAA, Ansett, East-West	25 per cent discount on economy fare	Not available on other discount fares	nil
Full-time or part-time student over 25 years travelling to or from university	East-West	10 per cent discount on economy fare	Not available on other discount fares	nil
Club 25	East-West	25 per cent discount on economy fare	nil	People under 26 years
Aged pensioner	East-West	40 per cent discount on economy fare		People 60 years and over, limited number of seats on each available flight

TABLE IV.1-(Cont)-AIR FARES OFFERED BY TAA, ANSETT AND EAST-WEST AIRLINES, JANUARY 1985

Fare type	*Airline offering fare*	*Premium/ discount*	*Booking and payment conditions*	*Travelling requirements*
TAA Air Pass Ansett Kangaroo Air Pass	TAA, Ansett	Average saving of 38 per cent. $500 for a maximum of 6000 km, $800 for a maximum of 10 000 km	nil	Minimum of 10 nights, maximum of 45 nights. Minimum of 4 nights in a port other than a capital city. Only one overnight stop in each port. Slight variation of conditions for overseas visitors.
See Australia	TAA, Ansett	30 per cent discount on economy fare	Book and pay for tickets 30 days in advance of departure	International travel must be on return economy promotional fares
International Add-on	TAA, Ansett	30 per cent discount on economy air fare to and from international gateway	Book and pay for tickets 30 days in advance of departure	International travel must be on return economy promotional fares

Sources: Ansett Airlines of Australia (1984). East-West Airlines (1984). Trans Australia Airlines (1984d).

travel and, as noted in Chapter 2, private travellers are the main users of discount fares.

The largest discounts offered on economy fares are the Flexi-Fare and the Excursion 45 fares offered by Ansett and TAA respectively. The discount offered on these fares amounts to 45 per cent of the economy class fare. Passengers are required to book and pay for their return tickets between four and 14 days prior to departure and the actual flight on which passengers are carried is determined by the airline. In the case of travel on high density routes it is guaranteed that forward and return journeys will be on the nominated day of departure. However, in the case of low density routes it is only guaranteed that forward and return journeys will either be on the nominated day or the next day a flight operates.

The fares apply to a limited number of economy seats on most routes. Cancellations or alterations of requested departure times are not permitted and cancellation penalties can be applied. However, insurance to cover voluntary cancellation is available.

APEX and Standby fares are offered under somewhat similar conditions to the Flexi-Fare and Excursion 45 fares. APEX fares offer a 35 per cent discount on economy air fares. The main difference between APEX and Flexi-Fare/Excursion 45 fares is that the departure time for a passenger travelling on an APEX fare is not determined by the airline. However, booking and payment conditions for APEX fares also require that tickets be paid for in advance; 30 days in advance in the case of TAA and Ansett and seven days in advance in the case of East-West Airlines.

Standby fares offer a 20 per cent discount on economy air fares and are distinguished from other discount fares on the basis that passengers are not required to make advance reservations but rather purchase their tickets at the airport. Allocation of seating is subject to seat availability immediately prior to departure.

In addition to these discount fares the three airlines also offer discounts for:

- group travel
- children
- students
- tourist travel.

Group travel discounts vary between 10 and 15 per cent of the economy class air fare. Discounts are available for groups with a common interest, sporting groups, charitable groups and the like. In the case of common interest groups there is a requirement for 15 or more adults to travel on the same aircraft on the forward journey. However, individuals within the group may return on separate flights. In the case of sporting and charity groups the conditions are more restrictive insofar as the entire group must return on the same flight.

In general, children's air fares are 50 per cent of the equivalent adult fares. The discounts which are available for adult air fares are not available with children's fares. The discounts offered for students range from 10 per cent on economy fares, which East-West Airlines offers to full or part-time students over 25 years of age travelling to or from university, to 50 per cent for full-time secondary students aged between 15 and 18 years.

The information in Table IV.1 indicates that the conditions and discounts attached to fares offered to tourists (Australian and overseas) vary widely.

In addition to the air fares described in Table IV.1 both Ansett and TAA offer special holiday fares (for example, TAA's 'Take 7' and 'Winter Escape' holidays). These may only be applicable at certain times of the year and form part of different holiday packages. They are also designed to promote specific holiday resorts, particularly the resorts operated by companies associated with TAA and Ansett. Special event packages are also available under some circumstances. These can involve individual travel and accommodation, as well as tickets to concerts, theatres and sporting events on a discounted basis.

INTRODUCTION OF AND CHANGES TO DISCOUNT AIR FARES

The structure of discount air fares has altered significantly over the last eight years. The major innovations have included the introduction of:

- standby fares
- advance purchase fares
- excursion fares
- tourist fares.

Standby fares

In September 1978 TAA and Ansett introduced Standby fares on selected routes on a two-month trial basis. These fares were initially offered at a 40 per cent discount on economy fares on routes between Sydney, Melbourne, Hobart and Launceston. At the end of the trial period the availability of Standby fares was extended to the remaining mainland capital routes (Brisbane-Sydney, Melbourne-Adelaide and Adelaide-Perth) following general public acceptance on the other routes. However, the discount was simultaneously reduced to 30 per cent.

In late 1979 approval was given to TAA and Ansett to extend the availablity of Standby fares to all major airports. However, a limiting factor in the increased availability of Standby fares was control over revenue dilution and, in this respect, load factors were an important issue.

In subsequent years the discount offered by Standby fares has been further reduced. The discount was reduced to 25 per cent in 1980 and subsequently reduced by a further 5 per cent in 1983. Currently, Standby fares offer a 20 per cent discount on economy air fares.

Advance Purchase Excursion (APEX) fares

Advance Purchase Excursion (APEX) fares were introduced by both TAA and Ansett in November 1977. Initially, APEX fares were introduced for a one-year trial period and offered a 25 per cent discount on economy fares on the condition that tickets were purchased 30 days in advance of departure.

The availability of APEX fares offered by TAA and Ansett was extended between October and November 1978. However, in May 1979 the APEX discount package was modified. A Super-APEX fare was introduced by TAA which offered a 40 per cent discount on economy air fares if bookings were made 45 days in advance of departure. However, the discount was available for only 169 days of the year. The discount offered by the APEX fare remained at 25 per cent, although its availability was extended to 286 days of the year.

In March 1980, TAA made Super-APEX fares available all year round rather than over a limited period. The TAA APEX fare became superfluous and was discontinued.

Ansett also withdrew its old APEX fare at approximately the same time and replaced it with three new APEX fares. The discount offered by

these fares ranged from 20 to 40 per cent depending on how far in advance of departure bookings were made.

The availability of Super-APEX fares was further liberalised in May 1980. TAA reduced the advance purchase period to 30 days with a 50 per cent refund if bookings were cancelled within this period. Ansett withdrew one of its three APEX fares which offered a 20 per cent discount on economy fares.

East-West also introduced a Super Saver fare at this time which offered a 30 per cent discount on economy fares on an all-year-round basis. Bookings had to be made seven days in advance of departure with a minimum duration of six days between forward and return journeys.

In the latter half of 1980, the discount on the Super-APEX fare was reduced from 40 to 35 per cent. This discount currently applies to Super-APEX, APEX and Super Saver fares offered by TAA, Ansett and East-West respectively.

Excursion fares

In the first six months of 1983 East-West Airlines had introduced excursion fares on a number of selected routes including Sydney-Melbourne and Sydney-Brisbane. In general, the discount offered by these fares amounted to 50 per cent of the respective economy fares.

TAA and Ansett also introduced excursion fares at this time; namely Excursion 45 and Flexi-Fare fares. These fares offered a 45 per cent discount on economy fares on the condition that bookings were made between four and 14 days in advance of departure. In addition, the actual flight on which Excursion 45 and Flexi-Fare passengers departed was at the discretion of the airlines.

Initially, both these fares were introduced for a 12-month trial period. At the end of this period both had proved to be worthwhile and were extended for another 12 months beyond July 1984. Similar booking and payment conditions for these fares currently apply.

Tourist fares

In 1975-76 and 1976-77 the marketing of discount air fares was directed towards the development of the holiday, group and convention travel markets. TAA, in particular, had placed emphasis on a policy of developing these markets through the introduction of travel

packages. As an example of this pricing policy TAA and Ansett experimented with a winter season fare for a number of east coast routes. Similarly, in 1976-77, holiday package prices were reduced for the off-peak seasons.

One element of the tourist fares offered by TAA was the See Australia fare which was designed to promote travel within Australia by international tourists. However, the fares, which offered a 30 per cent discount on economy travel, could only be purchased in North America and were only available for journeys exceeding 1680 kilometres.

In May 1979 the conditions of the See Australia fare were liberalised. The fare was made available world-wide and applied to any journey exceeding 1000 kilometres. The discount remained at 30 per cent and the fare had to be purchased in conjunction with a promotional international fare.

In addition to the liberalisation of the See Australia fare, International Add-on fares were also introduced at the same time. These fares were designed to provide less expensive services to passengers travelling to international gateways. The fare provides a discount of 30 per cent on economy fares for domestic travel in conjunction with international travel.

East-West also introduced discount fares for tourists at approximately the same time, including a $99 pass fare which entitled overseas visitors to unlimited travel within New South Wales for 14 days. East-West had previously offered special tourist discounts on selected routes. For example, discounted economy fares for Sydney-Alice Springs/Sunshine Coast/Hobart services were available.

Similar fare innovations to the East-West pass fare have been introduced by TAA and Ansett. For example, TAA's Air Pass and Ansett's Go Australia fare provide for special flying arrangements for overseas visitors. Equivalent fares for domestic passengers also currently exist.

CHANGES IN THE AIR FARE FORMULAE 1974 TO 1984

Changes in types of air fares over time have been accompanied by changes in the formula on which economy fares are based. The changes for TAA and Ansett jet services between 1974 and 1984 are summarised in Table IV.2. Fares for the F27 services operated by TAA, Ansett and East-West are based on a different formula.

TABLE IV.2-CHANGES IN ECONOMY AIR FARE FORMULA FOR TAA AND ANSETT JET SERVICES

Date of approval	*Flag-fall component ($)*	*Distance component* B ($ per '000 km)	C	D	*First class fare (per cent of economy fare)*
12.8.74	6.00	43.20	..	..	125.0
28.11.74	6.00	42.98[a]	..	..	..
26.7.75	8.00	48.96	..	..	..
19.9.75	8.60	52.63	..	..	..
20.4.76	8.86	54.21	..	..	..
1.7.76	9.13	55.83	..	..	..
1.7.77	10.50	57.03	..	..	..
20.9.77	10.87	59.01	..	..	..
14.7.78	13.00	60.93	..	..	..
30.9.78	13.70	63.93	..	..	..
14.6.79	17.00	68.31	..	..	..
31.1.80	19.80	72.27[b]	..	..	..
8.6.80	20.70	75.19	..	..	137.5
1.9.80	21.80	78.88	..	..	..
1.4.81	40.00	68.48[c]	..	..	145.0
11.8.81	43.20	73.96	..	..	..
31.12.81[d]	46.10	78.84	..	..	..
22.7.82	48.40	82.78	..	..	..
18.9.82[e]	40.30	117.75	-12.50	0.35	150.0
6.1.83	40.90	129.70	-17.90	1.37	..
1.7.83	41.40	131.39	-18.13	1.39	..
3.10.83	43.50	140.54	-20.24	1.68	..
2.4.84	44.40	143.35	-20.64	1.71	..
3.9.84	46.00	149.01	-22.35	2.01	..

a. Following a determination by the Flight Crew Officers Tribunal on 28 November 1974, the Minister for Transport directed the airlines to set fares at 0.5 per cent below the level approved in August of that year.
b. Two-tier distance rate introduced, 85 per cent of first distance rate after 2200 km on Perth-Melbourne, Sydney-Perth, Adelaide-Darwin and Brisbane-Darwin routes.
c. Formula changed significantly after consideration of Holcroft recommendations; flag-fall component increased and distance component decreased.
d. Commencement of IAFC determination of formula.
e. New air fare formula introduced following IAFC cost allocation review of August 1982. Fare = $A + Bx + Cx^2 + Dx^3$ where B, C and D are distance coefficients.

.. not applicable

Sources: Department of Aviation (1982 to 1984). IAFC (1982, 1983 and 1984). Department of Transport (1976 to 1981).

At the request of the Commonwealth Government, TAA and Ansett introduced new fare structures on 12 August 1974 based on a national air fare formula. This formula consisted of two components: a flag-fall component and a distance component based on a standard rate per kilometre flown. The effect of this formula was to ensure that passengers paid the same fare anywhere in Australia for journeys of similar distance and class of travel. Prior to 1974 air fares were not set in such a systematic fashion. The fares at that time were based on those in force when services first commenced, adjusted by a flat percentage at times of tariff increases.

In August 1974 the economy fare formula consisted of a flag-fall charge of six dollars and a distance rate of 4.32 cents per kilometre. The distance component was calculated using the route used by the majority of passengers. The differential between first class and economy fares was set at 25 per cent of economy air fares.

In July 1975 the air fare formula was reviewed by the Commonwealth Department of Transport at the request of the Minister for Transport. An average increase in fares of 16 per cent was recommended. Accompanying this recommendation was a change in the structure of the formula. The flag-fall charge was increased to eight dollars and the distance charge was increased to 4.896 cents per kilometre.

Between July 1975 and September 1980 flag-fall charges increased by 172 per cent in nominal terms. The charges comprising the distance-related component of the formula increased over the same period, but only by 61 per cent. The largest increase in flag-fall and distance components occurred in June 1979, when flag-fall charges increased by $3.30 and distance-related charges increased by approximately 0.4 cents per kilometre. Of the seven increases which occurred between 1975 and 1980 only one was associated with a change in the actual formula. This occurred in July 1977 when the flag-fall component was increased by 15 per cent and the distance rate by 2.1 per cent. This represented an average increase in air fares of 4 per cent.

The major change to the air fare formula in 1980 was the introduction of a two-tier distance rate. The second distance rate applied to four routes:

- Melbourne-Perth
- Sydney-Perth
- Darwin-Adelaide
- Darwin-Brisbane.

For these routes 85 per cent of the first distance rate was charged after 2200 kilometres. The change to a two-tier distance rate was a result of recommendations made in 1978 in the *Domestic Air Transport Policy Review*. It was concluded in this Report that a multi-tiered distance rate would more accurately reflect airline costs.

In February 1981 the *Domestic Air Fares: Report of the Independent Public Inquiry* (Holcroft Report) was released. Significant changes were subsequently made to the basic economy formula in April 1981 in response to the recommendations made in this Report. This resulted in a fundamental change in the weightings given to the flag-fall and distance components within the formula. Flag-fall charges increased by approximately 84 per cent while distance charges fell by 13.2 per cent over previous levels.

As a result of this change the structure of fares altered markedly. Air fares on short-haul routes rose while on long-haul routes there was some decline in fares. On average, air fares increased by 7.4 per cent in nominal terms.

In January 1982 the IAFC completed its first cost allocation review. The IAFC's determinations in this Report resulted in changes to the basic structure of the formula. Up until this point in time the formula had taken the form:

$$a + bx$$

where a is the flag-fall component, b is the distance coefficient and x is the distance travelled. The 1982 cost allocation review recommended that the distance component take the form of a third degree polynomial. Hence, the current formula takes the form:

$$a + bx + cx^2 + dx^3$$

where c and d are additional distance coefficients. The use of this formula results in lower economy fares than calculated by the previous formula for long distance routes, reflecting the lower costs per kilometre associated with the provision of services over these routes.

The differential between economy and first class air fares has also altered over time. In June 1980 the differential was increased from 25 per cent to 37.5 per cent. This was subsequently increased by another 7.5 per cent in April 1981. Currently, first class air fares are 50 per cent higher than economy fares. This differential was set in 1982.

APPENDIX V-THE DETERMINATION OF AIR FARES

The current methodology underlying the determination of domestic air fares originates from the provisions of the *Independent Air Fares Committee Act 1981*. This Act established the IAFC and set down criteria to be satisfied in determining air fares.

Although these criteria are clearly specified in the Act, administrative and information constraints placed upon the IAFC have raised the possibility that these criteria are not being fully satisfied in practice. The objective of this appendix is to provide details of the current framework for determining air fares.

INSTITUTIONAL ARRANGEMENTS IN FARE DETERMINATION

Prior to 1981 all domestic air fares were determined by the Minister responsible for aviation matters. Subsequently, the process of air fare determination was formalised through the provisions of the *Independent Air Fares Committee Act 1981*. This Act established the IAFC, which commenced operations in November 1981.

The provisions of this Act empower the IAFC to review and determine passenger air fares for all regular public transport (RPT) air services throughout Australia (IAFC 1983, p1). In doing so, the IAFC has four distinct responsibilities. These involve the undertaking of:

- cost allocation reviews (section 13)
- major air fare reviews (section 15)
- minor air fare reviews (section 16)
- the approval of discount fares (section 17).

Cost allocation reviews determine the formulae upon which air fares are structured. Specifically, the *Independent Air Fares Committee Act 1981* requires that air fares consist of two components:

- a fixed initial amount referred to as the 'flag-fall' component; and

- an amount for each kilometre travelled on the route, referred to as the 'distance' component.

In undertaking a cost allocation review the IAFC is required to identify all costs (including a provision for profit) incurred by the airlines in providing RPT air services and allocate them between these components. The cost allocations determined by the IAFC are then used in major or minor air fare reviews to establish the coefficients of the formula from which economy air fares are calculated. The IAFC is also required to determine the differential between economy and first class air fares as part of a cost allocation review.

Section 14 of the *Independent Air Fares Committee Act 1981* requires the IAFC in undertaking a cost allocation review to ensure that:

- air fares are determined on a consistent basis;
- the level of air fares is related to the cost of providing services;
- air services are operated on an efficient and economic basis; and
- the effect of the level of air fares on demand is accounted for in determining air fares.

While the relative impact of these principles on air fare determination has not been clear there has been some concern that current cost allocation procedures have failed to fully satisfy some of these criteria. The cost allocation methodology adopted by the IAFC is examined in greater detail in the following sections.

AN OVERVIEW OF THE IAFC'S COST ALLOCATION METHODOLOGY

The IAFC has completed two cost allocation reviews since its inception in 1981. The first cost allocation review examined the operations of Ansett and TAA. This review was completed in 1982. In 1984 a cost allocation review examining the operations of Air Queensland was concluded and a third cost allocation review has recently been announced examining the operations of East-West Airlines and Skywest Airlines.

From these reviews a well defined cost allocation methodology has been developed. The matters identified by the IAFC as important in the context of a cost allocation review include:

- establishment of the level of capital resources employed by the airlines;

- identification and treatment of attributable costs of RPT air services;
- allocation of costs (including a provision for profit) not specifically attributable to flag-fall or distance components;
- criteria for identifying air services over a number of routes having similar characteristics;
- efficiency standards for the setting of air fares; and
- price and revenue elasticities of demand.

Isolated financials and air fare financials

The cost allocation methodology developed by Price Waterhouse Associates (PWA) for the first cost allocation review forms the basis of the methodology adopted by the IAFC. Under the PWA methodology the airlines are required to prepare isolated financials from which the IAFC prepares actual and estimated air fare financials.

The preparation of isolated financials recognises that airline operations cover a wide range of activities and not simply RPT services. Their preparation allows for the identification of revenues and costs attributable to RPT services and therefore permits comparisons between airlines to be made on a consistent basis.

The preparation of isolated financials involves two steps:

- the preparation of a balance sheet; and
- the preparation of a profit and loss account.

The balance sheet presents information on fixed assets, working capital and loans and is intended to provide information on how funds are sourced and employed by the airlines. In identifying fixed assets only historical costs are taken into account. Depreciation costs, calculated at rates determined by the IAFC, are subtracted from this amount. The value of leased equipment is also included in these calculations. Working capital is calculated by adding the total amount of stock held, the amount of outstanding debts and any prepayments that have been made. Amounts owed to creditors and any accruals or provisions made are deducted from this total. The value of long-term loans includes loans which are secured on, or related to, RPT assets and also includes any future liability with respect to lease payments.

The profit and loss statement provides information on operating revenues and costs. Revenues include those attributed to RPT services

but also include revenue generated from cargo, charter, and international services and other activities carried out using RPT assets and personnel.

Operating costs are divided into direct and indirect components. Direct operating costs include such items as:

- fuel and oil
- aircraft engineering
- flight crew
- aircraft depreciation
- aircraft insurance
- air navigation charges.

Indirect operating costs include such items as:

- ground operations
- traffic and services
- finance
- administration
- catering
- sales and reservations
- automatic data processing.

Foreign exchange gains or losses and the amortisation of unrealised gains or losses are not included in cost calculations. However, depreciation charges are included and are calculated on the proportion of hours flown annually. Any profit or loss made on the sale of aircraft is excluded.

The isolated financials prepared by the airlines are used by the IAFC in the preparation of the air fare financials. These are used to determine the total costs (including a provision for profit) which need to to be recovered by airline operators.

As in the preparation of the isolated financials, the estimated air fare financials involve the construction of a balance sheet and a profit and loss account.

The estimated amounts of fixed assets, deferred assets and working capital included in the air fare financials are extracted from the

isolated financials. The balance sheet is completed by assuming that net assets are funded by a combination of shareholders' funds and loans in a proportion determined by the IAFC. In both cost allocation reviews conducted it has been assumed that 30 per cent of shareholders' funds and 70 per cent of loans are used to fund expenditure on assets.

Information on operating costs, overhead costs and depreciation is also extracted from the isolated financials. To these, a notional return on shareholders' funds and an interest charge are added. The interest charge is calculated at prevailing interest rates to service the notional loans, while the rate of return is determined by the IAFC.

The revenue generated from other activities, as estimated from the isolated financials, is then deducted from the total cost calculation. The net amount represents the total amount of revenue required to be generated from RPT air services.

Cost allocation

Once the total costs attributable to the provision of RPT air services have been identified the IAFC is required to allocate them between the flag-fall and distance components of the formula.

Two different cost structures are identified; attributable and residual costs. By definition the allocation of attributable costs is relatively straightforward. However, the nature of residual costs precludes a clear attribution between the flag-fall and distance components of the formula. In view of this the IAFC decided in the 1982 cost allocation review that residual costs should be allocated on a 'block-flying' hour basis[1]. In the case of jet services 20 per cent of residual costs were allocated to the flag-fall component and the remainder to the distance component. Residual costs were allocated to the distance component on a non-linear basis as it was believed that a direct relationship between fare elasticities and distance did not exist. This argument suggests that if costs were allocated on a linear basis distortions in demand patterns would occur. The allocation of residual costs on a non-linear basis resulted in a relatively smaller amount of residual costs being allocated to longer and shorter distance routes as compared with medium distance routes.

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1. Block-flying hours includes aircraft time spent in taxiing, take-off and climb, descent and landing and flying time.

This method of allocating residual costs was rejected in the Air Queensland cost allocation review. On the basis of evidence provided by Air Queensland, the IAFC concluded that it would be more appropriate to allocate residual costs in the same proportion as that of flag-fall and distance costs to total costs (excluding the provision for profit).

An example of how costs are allocated between the components of the formula is presented in Table V.1. This example is for jet services operated by TAA and Ansett as determined in the 1982 cost allocation review. These allocations currently apply and are scheduled to be reviewed in August 1985. Costs were allocated in a different manner for TAA's and Ansett's F27 services and subsequently for Air Queensland services in the 1983 cost allocation review.

In allocating fuel costs it is acknowledged that fuel consumption consists of two components: a constant component related to take-offs and landings (independent of distance travelled) and a variable

TABLE V.1-ALLOCATION OF COSTS FOR JET SERVICES PROVIDED BY ANSETT AND TAA, 1982

(per cent)

Item	*Flag-fall*	*Distance*	*Residual*
Direct and indirect operating costs			
Fuel	20	80	0
Flight crew	20	80	0
Engineering	29	17	54
Air navigation charges	10	90	0
Aircraft depreciation	20	80	0
Aircraft insurance	20	80	0
Flight attendants	33	44	23
Aircraft catering	0	85	15
Reservations and sales	19	19	62
Ground services and handling	87	4	9
Administration	0	0	100
Automatic data processing	60	0	40
Interest	16	64	20
Profit	0	0	100
Flag-falls foregone	0	0	100

Source: IAFC (1982, p20).

component which is a function of route distance. The constant component is allocated to the flag-fall part of the formula and the remaining costs to the distance component. The proportions allocated between flag-fall and distance components will vary with aircraft type. For example, it was established in the Holcroft Report that for a B727-200 fuel consumption comprised a constant component of 1500 litres and a distance related component of 6.9 litres per kilometre. In comparison, the respective cost components for a DC9 were 900 litres and 4.4 litres per kilometre.

Flight crew costs were found to vary with tours of duty and journey length. Crew costs were allocated on this basis, resulting in 80 per cent of costs being allocated to the distance component and the remainder to the flag-fall component for jet services. For F27 services and other smaller capacity aircraft a greater proportion of crewing costs is generally allocated to the flag-fall component.

A linear relationship between air navigation charges and stage length has been identified by the IAFC in both cost allocation reviews. The relationship has also been confirmed in most submissions to the IAFC. As a consequence, the major proportion of air navigation charges has been allocated to the distance component.

Aircraft depreciation and aircraft insurance costs in both cost allocation reviews have been treated in the same manner. Depreciation charges have been allocated on a 'block-flying' hour basis. In the case of TAA and Ansett jet services this has resulted in 20 per cent of depreciation costs being allocated to the flag-fall component of the formula and the remainder to the distance component. The IAFC considered that insurance costs were related to the capital cost of the aircraft, which was thought to decline with time and use. Hence, insurance costs were allocated in the same manner as depreciation costs.

The costs associated with flight attendants were allocated on the basis of information provided by TAA to the IAFC. However, in the case of catering costs, it was established that they increased as distances travelled by passengers increased. On this basis a greater proportion of catering costs were allocated to the distance component; the remainder were allocated to residual costs.

The majority of expenses incurred with reservations and sales were treated as residual costs, although the IAFC found justification for allocating some of these costs to the flag-fall and distance

components. However, ground services and handling costs were largely allocated to the flag-fall element. Administration costs were treated wholly as residual costs.

Interest payments have been treated in the same manner as depreciation charges. The rationale for this was that interest payments are a cost of borrowing and are related to the purchase of capital equipment. As the value of capital equipment was assessed to decline with use over time, the IAFC allocated interest costs on the same basis as depreciation charges, that is, on a 'block-flying' hour basis.

The provision for profit is allocated in a different manner from that of depreciation and interest charges. It was argued that no decisive method of allocating profit between flag-fall and distance components existed and as a consequence the entire profit provision should be allocated to residual costs.

On some routes multi-stage passengers incur a single flag-fall charge and secondary flag-fall charges are foregone. These are recovered through the flag-fall charges imposed on all passengers. The IAFC found no evidence to suggest that a definitive relationship between flag-falls foregone and distance existed and on this basis treated these costs as residual costs.

Once load factors are determined and costs are allocated between the flag-fall and distance components of the formula, the total required revenue calculated in the air fare financials is used to calculate air fares. Table V.2 provides information on the air fare formulae as at June 1984.

TABLE V.2-APPROVED AIR FARE FORMULAE, AS AT 30 JUNE 1984

Operator	*Service*	*Effective date*	*Flag-fall ($)*	*Distance rate (c/km)*
Ansett Airlines of Australia and Trans Australia Airlines	Jet	2.4.83	44.40	a
	F27	3.10.83	44.70	14.858
Air New South Wales	F27 and F28-1000	2.5.4	33.26	12.830
Air Queensland	F27	21.5.84	44.06	15.146
	NSAL[b]	21.5.84	26.27	18.345
	SSAL[c]	21.5.84	29.77	22.117
Airlines of Northern Australia	F28	1.7.83	41.50	12.961
Airlines of South Australia	F27 and light aircraft	19.5.84	23.55	15.053
Airlines of Western Australia	F28	12.3.84	35.40	12.916
East-West Airlines	F27	15.3.84	31.20	14.013
Kendell Airlines	Metroliner	6.6.84	37.70	12.440

a. Distance component = $BX + CX^2 + DX^3$
where B = 143.35; C = -20.64; D = 1.71
- 'X' expressed in kilometres (000's)
- distance rate 6.118 c/km in excess of 3611 km.
b. Northern Supplementary Airline Licence.
c. Southern Supplementary Airline Licence.

Source: IAFC (1984, p39).

APPENDIX VI-AIRLINE COSTS

COST CONCEPTS

A number of different cost concepts are relevant in examining airline costs. These include:

- marginal costs
- joint and common costs
- direct operating costs
- indirect operating costs
- overhead costs
- avoidable costs.

Marginal cost is the relevant cost concept when maximisation of economic efficiency is an important concern. Marginal cost is defined as the additional cost incurred in providing an extra unit of output. However, marginal cost differs with the time frame under consideration. In the short-run the marginal cost of an additional passenger may be close to zero up to the point where capacity is fully utilised. However, in the long-run, when changes in capacity are considered, marginal cost may be relatively high.

Where there are shared inputs in the productive process, marginal costs may include joint and common costs. Joint costs arise when the production of one good automatically results in the production of another and both are produced in fixed proportions. Similar production conditions apply in the case of common costs with the exception that outputs are produced in variable proportions. Examples of joint and common costs in the airline industry include the provision of passenger and freight services using the same aircraft, reservation facilities, baggage handling, ticketing and other airport facilities. In all cases there is no precise means of allocating costs among the outputs produced.

While marginal, joint and common costs are conventional economic cost

concepts, the general approach to categorising airline costs is to divide them into two groups:

- direct operating costs
- indirect operating costs.

Direct operating costs are those costs directly related to the operation of an aircraft flight. These costs include fuel costs, crewing costs, maintenance expenses, insurance, depreciation and air navigation charges. Indirect operating costs mainly include the overheads associated with airline operations, for example, reservations, advertising, some airport infrastructure and general administration expenses.

Direct and indirect operating costs may be further distinguished on the basis of avoidability and variability. Avoidability is concerned with the level of cost savings that could be made if certain services were not offered to passengers. An example of avoidable costs is fuel costs which would not be incurred if specific flights were not operated. Some maintenance costs and depreciation costs may be regarded as avoidable costs if they relate to aircraft usage rather than obsolescence.

Crewing costs, reservation, baggage handling and general administration expenses are not avoidable costs in the short-run. These costs would still be incurred in the provision of other air services even though some services may be terminated. However, these costs are only unavoidable in the short-run. All costs become avoidable in the long-run.

The costs of providing air services may vary on a number of different bases including aircraft type, stage length, load factors and route structure (including the number of take-offs and landings). For example, fuel costs and air navigation charges vary with the number of flights operated (although air navigation charges are fixed with respect to distances flown) and aircraft type. However, administration expenses and the like are generally regarded as fixed costs because they vary little with the level of service provided.

The inter-relationship of costs

One major reason for examining airline costs is to identify whether economies of scale exist in the provision of air services. Other considerations include the variability of airline costs with changes in input prices and the relative costs associated with the operation

of different airlines. The question of economies of scale in the provision of airline services is addressed here. The remaining issues are considered in Chapter 3.

Economies of scale exist when the average per unit cost of production falls as increasing units of output are produced. One measure of economies of scale in the airline industry is the cost per passenger-kilometre flown. This reflects a number of inter-relationships between various cost-related factors, including stage length, aircraft capacity and load factors. Perhaps the most important of these variables is the load factor, as it provides the link between the cost of supplying capacity and average passenger costs. The higher the load factor the lower will be the average unit passenger cost. The only case where average unit passenger costs and average seat costs coincide is when load factors are 100 per cent, that is, when available capacity is fully utilised.

One way of minimising unit passenger costs is to operate aircraft at the highest possible load factor. However, there exists a trade-off between load factors and frequency of service and other quality of service factors. For example, when load factors are low, passenger comfort is likely to be higher and there is a greater probability of obtaining a seat on the passenger's preferred flight. This is a significant aspect as non-price competition is an important dimension of competitive behaviour in a regulated market. If frequency is an important consideration then cost minimisation through the maintenance of high load factors may not be possible.

EVIDENCE OF ECONOMIES OF SCALE

A number of studies have sought to identify the extent of economies of scale in the provision of air services.

BTE study

Recent BTE research has examined the resource cost of operating different aircraft over varying distances (BTE 1985c). In undertaking this analysis the following cost items were examined:

- fuel costs
- crew costs
- air navigation charges
- insurance costs

- annualised capital costs (calculated on the basis of replacement costs)
- maintenance costs.

These components form the total direct operating costs of providing air services. Indirect operating costs were not examined in the analysis.

The data in Table VI.1 indicate that significant economies of scale are associated with stage length. Direct operating costs per unit of output for all aircraft types fall as stage length increases. The costs associated with operating aircraft over 3000 kilometres are approximately half those incurred over 200 kilometres. For example, an A300 operating over 200 kilometres costs approximately 6.3 cents

TABLE VI.1-DIRECT OPERATING COSTS OF DOMESTIC AIRCRAFT[a]

(cents per seat-kilometre)

Aircraft type	*Annual block hours*	*Kilometres*				
		200	*500*	*800*	*1 500*	*3 000*
F27	2 500					
36 seats		10.4	8.7	7.9	7.0	..
48 seats		7.8	6.5	5.9	5.3	..
F28	3 000					
70 seats		7.8	5.8	4.8	4.2	..
DC9	2 800					
94 seats		8.9	6.1	5.5	4.5	..
B737	3 000					
105 seats		7.7	5.5	4.5	4.1	3.6
B727	3 250					
148 seats		6.4	4.6	4.0	3.6	3.2
B767	3 250					
211 seats		7.2	5.2	4.5	4.0	3.7
A300	3 250					
290 seats		6.3	4.6	3.8	3.5	3.3

a. Preliminary estimates using 1984 prices. Costs were calculated as a range and only the mid-points are reported here. In view of the variability in operating conditions, relative cost differences between aircraft types of about ± 10 per cent are unlikely to be significant.

.. not applicable

Source: BTE estimate.

per seat-kilometre compared to 3.3 cents per seat-kilometre over 3000 kilometres. Aircraft with an operating range up to 1500 kilometres do not exhibit the same degree of economies of scale in terms of stage length.

It may be expected that larger capacity aircraft would possess significant cost advantages over small aircraft because costs are spread over a greater number of seats, especially over longer distances. However, the analysis provides little support for this conclusion.

Although the individual estimates of direct operating costs can only be regarded as indicative, Figure VI.1 indicates that no substantial difference exists in the costs of operation of B727, B737 and B767 aircraft even though they are of widely differing capacity. The cost relativities of these aircraft are mostly maintained over all distances examined. Furthermore, smaller capacity aircraft such as the DC9, F28 and F27 appear to be little more expensive to operate over short stage lengths than some larger capacity aircraft.

This evidence therefore suggests that few economies of scale associated with aircraft size exist in the operation of domestic airline services. In shows that small capacity aircraft can probably compete on an economic basis with large capacity aircraft over short distances.

This conclusion needs to be qualified in a number of ways. First, the analysis does not include indirect operating costs. However, as there are no precise means of allocating these costs it is not possible to determine *a priori* what effect they would have on economies of scale. Second, the extent of economies of scale as measured by costs per passenger kilometre will be affected by load factors. Differences in load factors between different aircraft types may produce further economies of scale or heighten potential diseconomies.

Finally, the estimates of direct operating costs have been calculated on the basis of 'ideal' maximum annual utilisation factors for each aircraft type. If these are not achieved in practice, cost relativities may be different[1].

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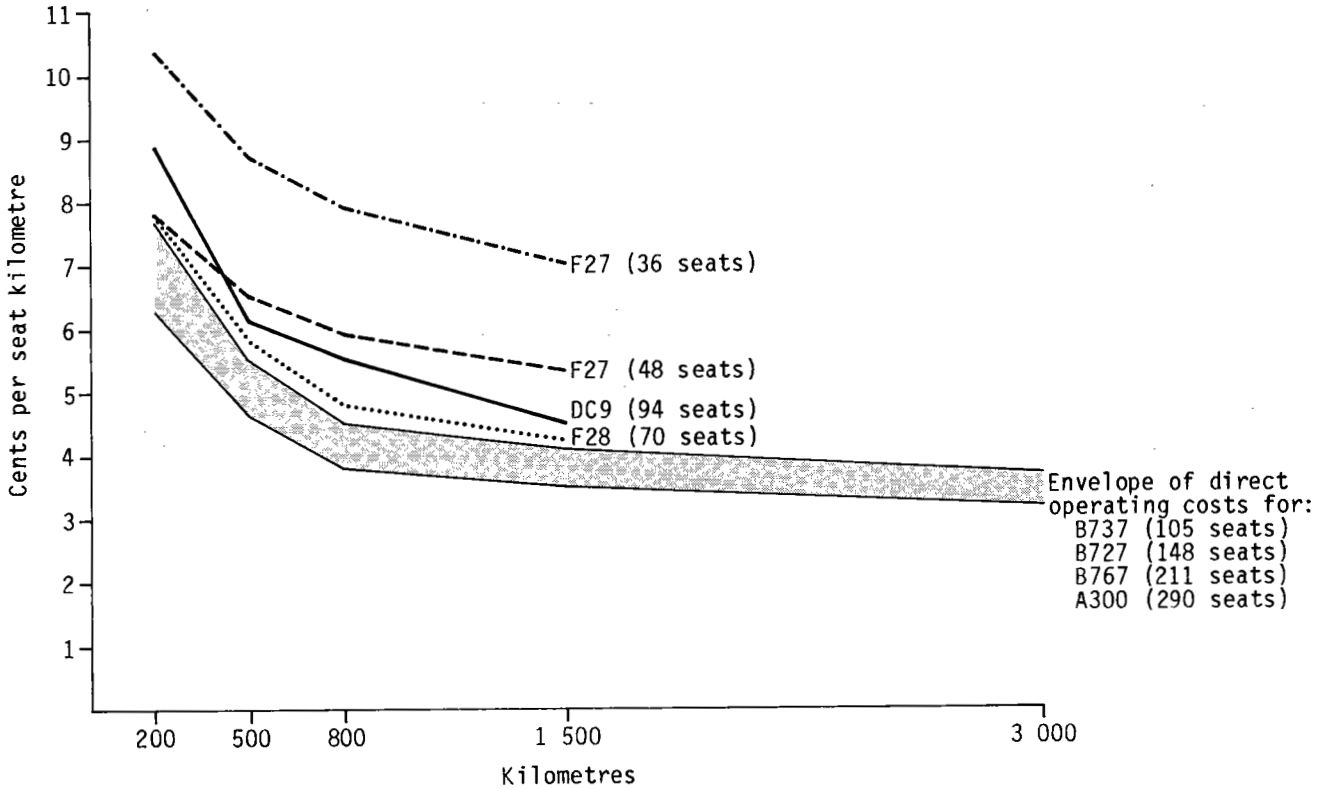
1. For example, the Airbus A300 cost is calculated on the basis of 290 seats, and 3250 hours utilisation. In fact TAA operated its A300s with 230 seats and, in 1983-84, for only 2183 hours.



Source: BTE estimates.

Figure VI.1.-Direct operating costs of Australian domestic aircraft

Other studies

Several other studies have examined the issue of economies of scale in airline operations. A summary of the findings of some of these studies is presented below.

Kirby (1984) employed econometric analysis in the examination of airline costs. A model of total airline operating costs was developed and estimated. These estimates indicated that substantial economies of scale existed with increased load factors, larger aircraft and increased stage length. However, diseconomies were found to exist with serving more airports and increasing the number of departures from airports.

Caves, Christensen and Tretheway (1984) also developed a model of airline costs to explain apparent cost advantages enjoyed by US trunk airlines over local service carriers. Using data for the years between 1970 and 1981 the model indicated that conditions of constant returns to scale applied to both trunk and local service carriers. However, significant economies associated with route density were found.

Hence, it was concluded that differences in scale had no role in explaining the high operating costs of small airlines. It was suggested that differences in network characteristics between trunk and local service carriers were the main explanatory factors. Low route density, low average stage length and low load factors were thought to contribute to local service carriers' high operating costs. This suggests that local service carriers could compete on an equal basis with trunk carriers on routes of equal length and equal density.

Graham and Kaplan (1982) also assessed the incidence of economies of scale in aircraft operation during their evaluation of the impact of deregulation of the US airline market. Operating costs for a number of different aircraft including the B727, B737 and B747 were estimated for various stage lengths.

This analysis established that some economies existed in operating larger aircraft over longer distances. However, the cost advantages in operating larger aircraft appear to be small in most instances. This is evident in the data provided in Table VI.2.

These data indicate that over a stage length of 200 miles (320 kilometres) smaller capacity aircraft (such as the DC9 and B737)

TABLE VI.2-COMPARISON OF DIRECT AIRCRAFT OPERATING COSTS, US DOMESTIC TRUNK AIRLINES, 1980-81

(US cents per revenue passenger-mile)

	Aircraft type (seats)					
Distance (miles)	*DC9-30 (115)*	*B737-200 (121)*	*B727-100 (125)*	*B727-200 (164)*	*DC10-10 (371)*	*B747 (500)*
200	12.0	11.7	14.0	12.1	12.5	15.4
400	8.3	8.1	9.5	8.1	7.8	9.0
600	7.1	6.9	8.0	6.8	6.2	6.9
800	6.5	6.3	7.2	6.2	5.5	5.9
1 000	6.1	6.0	6.8	5.8	5.0	5.2
1 250	..	..	6.4	5.5	4.6	4.7
1 500	..	..	6.2	5.2	4.4	4.4
1 750	..	..	..	..	4.2	4.1
2 000	..	..	..	..	4.0	4.0
2 250	..	..	..	..	3.9	3.8
2 500	..	..	..	..	3.9	3.7

.. not applicable

Source: Graham and Kaplan (1982, p80).

possess a cost advantage of up to 31 per cent over large capacity aircraft (such as the B747).

However, over a stage length of 1000 miles (1600 kilometres) the DC-10 and B747 possess a cost advantage of between approximately 20 and 25 per cent over smaller capacity aircraft. For distances between 200 and 1000 miles the cost savings of large capacity aircraft are not as substantial. This suggests that significant economies of scale associated with aircraft type would not exist over most short distance routes.

However, Graham and Kaplan's analysis indicates that significant economies of scale are associated with stage length. For each aircraft type examined, operating costs fall as distance travelled increases. This is in general agreement with the conclusions drawn in the other studies considered in this appendix.

Grenning and Coat (1979) examined a number of studies concentrating on the economies of scale issue. The findings of some of these studies are summarised below.

Douglas and Miller (1974) examined the nature of airline cost data through the use of regression analysis. This analysis indicated that average costs fell as stage length and aircraft capacity increased. Diseconomies, however, were found to be associated with serving busy airports. In general, the regression analysis indicated that costs slightly increased then declined as output increased.

Studies by Strazheim (1969) and Eads, Nerlove and Raduchel (1969) found that constant returns to scale existed in most airline operations. The singular exception appeared to be in the case of what was referred to as 'local service' carriers. The main reason for this was the low level of output provided by these carriers.

An analysis of airline costs by Sarndal and Statton (1975) found that some economies of scale existed with networking of airline operations. It was concluded that aircraft fleet characteristics were determined by network characteristics including route lengths, route densities and number of departure points. Where a network consisted of both short and long-haul routes some economies of scale associated with aircraft operation over these routes were found.

Mackay (1979) employed regression techniques to examine the relationship between operating costs and route characteristics, airline fleet characteristics, the external environment and airline management efficiency. The results of this analysis indicated that if TAA and Ansett merged, a reduction in operating costs of 4 per cent could be expected. Grenning and Coat (1979) interpreted this as indicating that under the current arrangements of the two airline policy very few economies of scale would exist.

On the basis of this evidence Grenning and Coat concluded that economies of scale were not simply a function of airline size but rather a function of a number of factors involving the inter-relationship between the characteristics of routes and the aircraft fleet. It was suggested that domestic air services were provided at constant returns to scale.

Forsyth (1981) also examined the issue of economies of scale in airline operation through the use of regression analysis. Using 1978 Civil Aeronautics Board (CAB) data, cost functions for two types of equipment (jet and turbo prop) were estimated. The determinants of costs were taken to be stage length, aircraft size and age of aircraft. No account was taken of the possible cost advantages of networking.

Forsyth found that significant economies were associated with larger capacity aircraft, especially with respect to fuel costs. Fuel costs were found to fall with stage length but rise with aircraft age and size.

ANALYSIS OF AIRLINE COST DATA

Some information on direct and indirect operating costs is contained in the airlines' annual reports. However, the information contained in TAA's annual reports provides the only useful guide to the relativities between different cost components.

Table VI.3 provides information on the direct and indirect operating

TABLE VI.3-TAA DIRECT AND INDIRECT OPERATING COSTS, 1979-80 TO 1983-84

($'000)

Item	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*
Direct operating costs					
Fuel and oil	80 622	102 587	112 129	115 985	123 337
Flying crew	30 875	34 658	42 364	49 800	51 468
Aircraft maintenance	50 334	57 969	62 883	65 603	65 236
Aircraft hire and lease	1 384	1 178	1 699	9 105	22 375
Air navigation charges	17 153	20 339	25 947	29 719	29 919
Insurance	1 012	1 062	1 283	1 560	2 067
Depreciation	15 973	16 349	22 929	24 034	18 444
Total	197 353	234 142	269 234	295 806	312 846
Indirect operating costs					
Airport operations and ground handling	39 404	45 242	50 551	55 387	62 535
Passenger services	34 445	44 093	55 068	61 326	71 661
Marketing	50 560	60 397	72 023	70 927	72 803
Administration	45 319	50 321	61 768	70 028	85 905
Total	169 728	200 053	239 410	257 668	292 904
Total	367 081	434 195	508 644	553 474	605 750

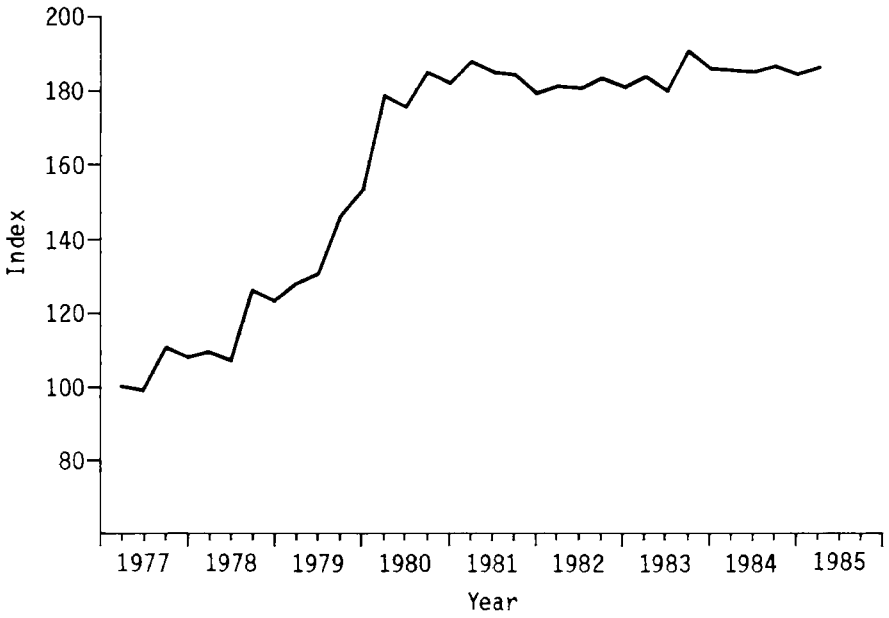
Source: Trans Australia Airlines (1980, 1981, 1982a, 1983 and 1984a).

costs of the TAA parent company for the years 1979-80 to 1983-84. In the five-year period examined the ratios of direct and indirect operating costs to total operating costs have remained substantially unaltered. Direct operating costs have generally formed between 50 and 53 per cent of total operating costs.

However, while the proportion of direct and indirect operating costs to total costs has remained fairly static there is evidence that the significance of the cost components which form these two categories may have changed over time.

Fuel costs

Time series information on movements in the price of avtur, the principal domestic aviation fuel, suggests that in nominal terms there have been substantial increases in the price of avtur in recent years (BTE 1985b). In March 1977 the price of avtur was 13.7 cents per litre and it subsequently rose to 49.1 cents per litre in March 1985. This represents an increase of nearly 260 per cent or an average annual increase of approximately 17 per cent. Taking into account the impact of inflationary forces over the same period the rise in the price of avtur has not been as dramatic, although it has still been substantial. This is borne out by Figure VI.2. This indicates that



Source: BTE (1985b).

Figure VI.2-Avtur prices (wholesale including excise): real terms

avtur prices rose by approximately 85 per cent between the March quarters of 1977 and 1985, or at approximately 8 per cent per annum. In real terms, avtur prices peaked in the September quarter of 1983. Real avtur prices have since remained reasonably stable.

This may not accurately reflect the impact of fuel prices on the domestic airlines. This is because special contracts are often negotiated between the oil companies and the airlines which reportedly offer discounts of up to 25 per cent on the maximum recommended price for avtur. However, the data presented above should be indicative of the impact of increases in fuel prices, if not the absolute incidence of price rises.

Some appreciation of the impact of rising fuel costs on total airline operating costs may be gained by analysing the operating cost data provided in the annual reports of TAA.

Information on fuel costs presented in Table VI.3 indicates that these costs have increased significantly in nominal terms over the five-year period examined. However, the proportion of fuel costs to other direct operating costs has not changed significantly. In both 1979-80 and 1983-84 fuel and oil costs formed approximately 40 per cent of total direct operating costs. In the intervening years the fuel/total direct operating cost ratio remained at similar levels. Hence, even though fuel costs represent a significant proportion of all direct operating costs, other cost components have increased by a similar magnitude. Prior to this five-year period, fuel costs were substantially lower and formed approximately 30 per cent of direct operating costs.

Flying crew costs

The salary expenses associated with the employment of flying crew have not increased significantly as a proportion of total direct operating costs. In 1979-80 flying crew salaries amounted to approximately 16 per cent of direct operating costs while in 1983-84 they accounted for approximately 17 per cent.

In nominal terms flying crew salary expenses in 1983-84 were 1.6 times greater than that incurred in 1979-80. This represents a real increase of approximately 16 per cent or an average annual increase of approximately 4 per cent.

Maintenance costs

Maintenance cost data provided by TAA in their annual reports indicate

that over the five-year period to 1983-84 maintenance costs increased in nominal terms by a factor of 1.3. However, taking into account trends in inflation, a real decline in maintenance costs has been experienced. Over the five-year period maintenance costs fell by approximately 10 per cent in real terms and also fell as a proportion of total direct operating costs. In 1979-80 maintenance costs formed approximately 25 per cent of direct operating costs while in 1983-84 they formed 20 per cent of direct operating costs.

The decline in maintenance costs has been accompanied by a greater fall in average annual aircraft utilisation, resulting in rising maintenance costs per flying hour. This is demonstrated in Table VI.4. Over the five years to 1983-84, maintenance costs per flying hour have risen by approximately 28 per cent in real terms.

A similar decline in average annual aircraft utilisation has not occurred for Ansett until recent years. Comparable maintenance cost information for Ansett is not readily available. As a result it is difficult to determine what the effect of the change in utilisation on maintenance expenditure has been.

Air navigation charges

The air navigation charges paid by TAA and Ansett over the period from 1979-80 to 1983-84 are summarised in Table VI.5.

In nominal terms the air navigation charges paid by TAA and Ansett approximately doubled over the five-year period. In real terms this represents an increase of approximately 26 per cent (or an average annual growth rate of approximately 6 per cent) in the case of TAA and

TABLE VI.4-TAA MAINTENANCE COSTS PER HOUR, 1979-80 TO 1983-84 (CONSTANT 1983-84 PRICES)[a]

	1979-80	*1980-81*	*1981-82*	*1982-83*	*1983-84*
Fleet utilisation (hours)	108 570	103 972	82 260	74 592	75 980
Maintenance cost per hour ($)	667	734	941	901	859

a. The Consumer Price Index was used to convert current price figures into constant price estimates.

Sources: Department of Aviation (1983b and 1984c). Department of Transport (1981 and 1982a).

approximately 45 per cent (or an average annual growth rate of nearly 10 per cent) in the case of Ansett. However these increases may be a reflection of increased activity, as well as real price increases.

Table VI.6 provides information on the average cost of air navigation charges incurred by TAA and Ansett per thousand tonne-kilometres of available capacity. These data indicate that air navigation charges collected from TAA and Ansett have risen in real terms despite

TABLE VI.5-AIR NAVIGATION CHARGES PAID BY TAA AND ANSETT, 1979-80 TO 1983-84

($ million)

Airline	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*
TAA	15.145	20.455	21.048	32.943	27.646
Ansett	14.929	22.620	24.408	29.425	31.208

Source: Department of Aviation (1983b and 1984c). Department of Transport (1981 and 1982a).

TABLE VI.6-AVERAGE COST OF AIR NAVIGATION CHARGES PER AVAILABLE THOUSAND TONNE-KILOMETRES OF CAPACITY, 1979-80 TO 1983-84 (CONSTANT 1983-84 PRICES)[a]

Airline	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*
TAA					
Available tonne-kilometres (million)	658	665	705	682	661
Cost per available thousand tonne-kilometres ($)	33	40	36	52	42
Ansett					
Available tonne-kilometres (million)	658	679	755	701	713
Cost per available thousand tonne-kilometres ($)	33	44	39	45	44

a. The Consumer Price Index was used to convert current price figures into constant price estimates.

Sources: Department of Aviation (1983b and 1984c). Department of Transport (1981 and 1982a).

capacity fluctuations for both airlines. In the case of Ansett, air navigation charge collections have risen by approximately 35 per cent (representing an annual average growth rate of approximately 7.6 per cent) while collections have risen by approximately 26 per cent for TAA (an average annual growth rate of approximately 6 per cent). The average cost per available thousand tonne-kilometres peaked in 1982-83 for both airlines.

APPENDIX VII-FINANCIAL ANALYSIS OF TAA AND ANSETT

ACCOUNTING POLICIES

In assessing the financial performance of TAA and Ansett, it would be desirable to make comparisons between the two airlines and between the airlines and Australian industry in general. However, there are some difficulties with making such comparisons directly.

One difficulty is that financial reports on airline activities are available for both airlines only for the last three years (1981-82 to 1983-84). Airline operations, including the regional airlines, have contributed 65 to 72 per cent of the revenue of Ansett Transport Industries, and about 85 per cent of consolidated TAA revenue. Thus, while airline activities are the most significant contributors to the overall financial performance, it cannot be assumed that the results from other activities are always similar.

There are also problems with different accounting policies adopted by the two airlines. In general, Ansett appears to follow standard Australian accounting practice. The main divergence from standard practice by TAA was in the area of treatment of interest payments. Standard practice is to capitalise interest payments made on a newly acquired asset before that asset comes into service; for example, interest paid on progress payments or deposits for new aircraft before delivery. Otherwise all interest would be treated as an expense in the year incurred and deducted from profit in that year. The TAA approach was to capitalise all interest payments anticipated over the life of a loan raised to finance specific aircraft and then to amortise the gross amount over the life of the aircraft. As the life of loans was generally shorter than the aircraft life, the interest cost was spread over a longer period and the charge each year was accordingly lower. Thus TAA's profit tended to be overstated in most years compared with the situation if standard accounting practice had been followed.

TAA changed this accounting policy in 1983-84 and figures provided in the annual report for that year give some indication of the impact of the policy on profitability. This is shown in Table VII.1, where it can be seen that the operating loss was understated by $6 million in 1981-82 and nearly $10 million in 1982-83. It is likely that profits in earlier years have also been overstated by several million dollars, although there is insufficient information in the TAA annual reports to identify the exact extent of the overstatement.

Other areas of divergence between TAA and Ansett on accounting matters include the treatment of foreign exchange losses on loans, accounting for changes relating to long service leave provisions and losses or gains on the sale of operating equipment (notably replaced aircraft).

The TAA practice is generally to classify these items as abnormal[1] and therefore include them in the calculation of operating profit or loss. The Ansett practice is to classify the foreign exchange and long service leave items as extraordinary expenses, which are not included in operating profit or loss. Capital gains on the sale of operating equipment appear in some cases to be included in Ansett's operating revenue and in other cases as abnormal items (following the TAA practice).

There are also other differences between the two airlines. These

TABLE VII.1-EFFECT OF CHANGE OF ACCOUNTING POLICY ON TAA PROFITABILITY

	Consolidated operating profit	
Year	*TAA practice ($ million)*	*Standard practice ($ million)*
1981-82	-3 381	-9 573
1982-83	-9 902	-19 522
1983-84	..	3 768

.. not applicable

Sources: Trans Australia Airlines (1983 and 1984a).

1. That is, unusual items related to the normal business of the organisation, as opposed to extraordinary items, which are gains and losses outside the normal business activities of the organisation.

include superannuation[1], depreciation periods and residual values for aircraft.

Furthermore, some of these accounting policies have changed from time to time, often with significant effects on financial results. The effect of the change in the TAA treatment of interest has already been shown. A further example is the Ansett approach to depreciation. In 1981, 727-200 series aircraft were changed from a historic cost to a current replacement cost basis for depreciation purposes. This resulted in an $8.4 million reduction in profit before tax (given that replacement cost, and hence the depreciation charge, was higher than historic cost). The policy was again changed in 1982, to fall into line with IAFC policies on depreciation; as a result depreciation was reduced, and profit before tax increased, by $14.1 million.

FINANCIAL COMPARISONS

Notwithstanding the problems outlined in the previous section, it is still instructive to make comparisons between the financial results of the airlines and Australian companies as a group.

Comparisons are made on two levels: a ten-year time series of the consolidated operations of Ansett Transport Industries and TAA; and the results of airline activities only for the last three years (based on the annual financial reports of the airlines to the Commonwealth Parliament).

In Table VII.2, it can be seen that TAA earned modest profits during the 1970s, with the highest annual profit ($8.8 million) occurring in 1979-80. This represented a 30.6 per cent return on average shareholders' funds. There followed a rapid decline into substantial losses in the early 1980s, and a return to a small profit in 1983-84. The high level of return on equity reflects the very low level of shareholders' funds, typically $25 million to $30 million over the period up to 1982 (see Table VII.3). A capital injection of $115 million in 1982-83 by TAA's shareholder, the Commonwealth Government, made a substantial change to the shareholders' funds and the return on equity calculation.

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1. There was at one stage a problem with an unfunded superannuation liability relating to TAA employees who were members of the Commonwealth Superannuation Scheme, rather than a commercial scheme. This liability has since been taken over by the Commonwealth, and TAA now pays no more than it would if all its employees were members of commercial superannuation schemes.

TABLE VII.2-PROFITABILITY OF TAA, ANSETT TRANSPORT INDUSTRIES AND AUSTRALIAN INDUSTRY, 1974-75 TO 1983-84

	TAA		Ansett		Australian industry return on equity	
Year	Net operating profit[a] ($ million)	Return on equity[b] (per cent)	Net operating profit[a] ($ million)	Return on equity[b] (per cent)	All industry[c] (per cent)	Services industry[d] (per cent)
1974-75	2.6	7.4	8.2	14.2	8.6	9.8
1975-76	1.6	5.5	14.4	23.0	9.2	11.5
1976-77	2.4	9.1	17.3[f]	22.8	9.6	13.5
1977-78	3.2	12.2	18.6[f]	20.0	9.5	13.9
1978-79	7.6	27.4	23.3	22.3	11.5	13.6
1979-80	8.8	30.6	21.3[f]	16.9	11.6	13.6
1980-81	3.2	10.4	22.2[f]	12.6	10.0	13.2
1981-82	-9.6[e]	..	54.0	22.7	6.9	12.1
1982-83	-19.5[e]	..	55.8	19.4	6.3	8.8
1983-84	3.8	3.6	44.2	14.6	9.2[g]	na

a. Net operating profit is calculated after deduction of tax, interest and depreciation, but before extraordinary items.
b. Return on equity is calculated as net operating profit, divided by the average of shareholders funds at the beginning and end of the financial year.
c. The all industry figure covers all industry sectors excluding the financial sector, and includes the manufacturing, wholesale, retail, services and mining industries.
d. The services industry includes transport.
e. Altered to reflect the change in TAA accounting policy for interest payments.
f. Adjusted in subsequent year. Adjusted figures used.
g. Preliminary

.. not applicable

Sources: Ansett Transport Industries (1975 to 1984). Reserve Bank of Australia (1981 and 1985). Trans Australia Airlines (1975 to 1981, 1982a, 1983 and 1984a).

Ansett's net operating profit has been consistently at least twice as high as TAA's, and on some occasions four or five times higher. Ansett revenues and total assets have been 50 to 100 per cent higher than TAA's, suggesting that Ansett has been clearly the more profitable of the two organisations. In none of the last ten years has Ansett's return on shareholders' funds been reduced to below 12 per cent, and in six of those years the return has been over 19 per cent.

Ansett's consistent, high profitability is further illustrated by comparison with Reserve Bank of Australia figures for all Australian non-financial industry and for the services industry. Ansett has out

TABLE VII.3-TAA EQUITY, DIVIDENDS AND PROPRIETORSHIP RATIO, 1974-75 TO 1983-84

	TAA			*Australian industry proprietorship ratios*[a]	
Year	*Equity ($ million)*	*Dividends ($ million)*	*Proprietorship ratio*[a] *(per cent)*	*All industry*[d] *(per cent)*	*Services industry*[d] *(per cent)*
1974-75	33.3	1.3	22	52	35
1975-76	26.3[c]	2.7	17	51	35
1976-77	26.2	2.3	14	51	35
1977-78	27.0	2.3	14	50	38
1978-79	28.4	6.0	12	49	38
1979-80	29.1	2.3	11	50	39
1980-81	31.7	2.3	8	51	41
1981-82	8.1[b]	-	2	49	40
1982-83	102.6[b]	-	17	48	42
1983-84	106.5	-	18	na	na

a. Proprietorship ratio defined as the proportion of total assets financed by shareholders' funds.
b. Altered to reflect the change in TAA accounting policy for interest payments.
c. Reduction over previous year reflects a change in accounting policy regarding insurance reserves.
d. As defined in Table VII.2

\- nil
na not available.

Sources: Trans Australia Airlines (1975 to 1981, 1982a, 1983 and 1984a). Reserve Bank of Australia (1981 and 1985).

performed both national average returns in every one of the last 10 years except 1980-81. TAA's performance has been decidedly uneven, but it has also out performed the service industry average in two of the last 10 years.

Table VII.3 presents a more detailed picture of TAA's difficulties with its debt-equity ratio. It can be seen that shareholders' funds remained almost constant over the seven years to 1980-81, while total assets increased by a factor of 2.5, from $151 million to $386 million over the same period. Accordingly, the proprietorship ratio (defined as the proportion of total assets financed by shareholders as opposed to lenders) declined from 22 per cent to 8 per cent. In fact, the ratio was probably lower than suggested by these figures because of the TAA treatment of interest payments noted earlier. Some indication of the impact of this accounting policy is shown in 1981-82, when shareholders' funds dropped to $8.1 million and the proprietorship ratio to 2 per cent.

This situation was exacerbated by the requirement for TAA to pay dividends that accounted for most of the tax-paid profit each year up to 1980-81. This prevented the accumulation of profits to improve the proprietorship ratio.

The significance of a low proprietorship ratio is that most assets (98 per cent for TAA in 1981-82) are funded by interest bearing loans and the cost of interest is essentially unavoidable. This high level of gearing means that a modest reduction in gross profit margins can lead to substantial losses and vice versa. Reference was made earlier to the volatility of TAA's profitability and the high gearing/low proprietorship ratios were a prime factor in magnifying the effect of small changes in gross profit margins.

Table VII.3 also shows figures for proprietorship ratios for Australian companies generally. It shows that, even after the Commonwealth Government equity injection in 1982, TAA's ratio, at 17 or 18 per cent, is much lower than the all-industry average of about 50 per cent and the services industry average of about 40 per cent. By way of comparison, Ansett's proprietorship ratio has fallen in a range between 24 per cent and 32 per cent over the last 10 years.

The gross profits recorded by TAA and Ansett are shown in Table VII.4. TAA earned a gross profit in the range of $30 to $38 million between 1976-77 and 1982-83. In the same period the Ansett gross profit doubled from $55 million to $110 million. The TAA performance demonstrates a gradual deterioration which is reflected in the

declining return on assets in Table VII.4. By this measure, TAA was earning gross profits comparable to Ansett (in relation to assets employed) in the middle to late 1970s, but gross profits declined from about 1979 onwards, reaching a low point in 1982-83 of 6.5 per cent. It is this decline in return on assets which would appear to be the cause of the losses recorded by TAA in 1981-82 and 1982-83 (see Table VII.2), as much as the inadequate level of equity.

Ansett's gross profit also fell in the early 1980s, following a general trend in the economy at large, although Ansett appears to have suffered little more than the average firm in Australia. It is notable that both TAA and Ansett have shown signs of a strong recovery in profitability in 1983-84 and this improvement is expected to

TABLE VII.4-GROSS PROFIT MARGINS OF TAA AND ANSETT TRANSPORT INDUSTRIES, 1974-75 TO 1983-84

	Gross profit[a]		*Return on assets*[b]		
Year	*TAA ($ million)*	*Ansett ($ million)*	*TAA (per cent)*	*Ansett (per cent)*	*All industry*[c] *(per cent)*
1974-75	na	40.0	na	17.3	13.6
1975-76	25.2	52.7	16.6	21.1	14.1
1976-77	30.7	55.0	18.2	19.6	14.2
1977-78	32.2	58.6[d]	17.0	18.5	13.9
1978-79	31.5	67.9	14.5	18.5	15.2
1979-80	37.2	70.7	14.5	15.6	15.8
1980-81	35.5	80.5[d]	10.8	13.9	14.7
1981-82	37.2	104.9	8.6	12.4	12.5
1982-83	34.9	110.2	6.5	10.0	11.7
1983-84	74.2	164.3	12.7	13.5	na

a. Gross profit is defined as trading revenue less operating expenses (other than depreciation and interest), or as operating profit before tax, plus interest and depreciation, less non-trading revenue.
b. Return on assets is gross profit divided by the average of total assets at the beginning and end of the financial year.
c. Relates to all industry sectors excluding the financial sector, as defined in Table VII.2.
d. Adjusted in subsequent years. Adjusted figures used.

na not available

Sources: Ansett Transport Industries (1975 to 1984). Reserve Bank of Australia (1981 and 1985). Trans Australia Airlines (1975 to 1981, 1982a, 1983 and 1984a).

continue in 1984-85 (see later section on profit projections).

The return on assets reflects the fundamental trading operations of TAA and Ansett. While both airlines suffered from the general economic recession, it is clear that TAA performed much worse than Ansett. This suggests that Ansett was more fortunate, or made better management decisions than TAA in the late 1970s and early 1980s. While TAA's financial position appears to have since improved, it has still not yet returned to the position of comparability with Ansett that was achieved in the mid-1970s.

As mentioned earlier, airline activities account for about 70 per cent of Ansett Transport Industries' revenue. By combining figures from Ansett's annual reports, and their reports to Parliament under the Airlines Agreement Act, it is possible to gain an indication of the contribution of airline activities to the overall performance of Ansett as described and discussed in this part of the Appendix. This is shown in Table VII.5.

The profitability of Ansetts airline activities dropped sharply in 1982-83, from $30.1 million to $15.1 million, but recovered in 1983-84 to $42.7 million. In addition net operating profit, as shown in Table VII.2, was significantly affected by changes in tax payments and income from other sources (primarily capital profits on the disposal of fixed assets). It seems that Ansett's non-airline activities suffered a marked downturn in profitability in 1983-84, which served to prevent the gains in airline activity from being reflected in a higher net operating profit for the organisation as a whole.

It should be noted that extraordinary items (not included in the figures shown in Table VII.2) have affected Ansett's profitability significantly in some years. Extraordinary profits were $98.7 million in 1983-84, essentially derived from the sale of shares in listed companies (believed to be Santos Ltd). An extraordinary loss of $14.4 million, due largely to currency exchange losses, was recorded in 1982-83. Ansett also paid dividends totalling about $7 million a year for a number of years up to 1978-79, then paid no dividends to ordinary shareholders until 1983-84. A dividend of $150 million was paid to shareholders in that year, followed by a further $50 million in July 1984 (after the end of the 1983-84 financial year).

Comparison of airline activities

Clause 13 of the Airlines Agreement Act requires TAA and Ansett to provide financial information to Parliament each year relating to

their total air service operations and to their operation of passenger air services on trunk routes. These reports, which are available for the 1981-82, 1982-83 and 1983-84 financial years, form the basis for the analysis presented in this section. The financial information is presented in the form of a profit and loss statement, a balance sheet and appropriate notes.

The TAA reports on total air services are in fact the same financial statements as presented in TAA's annual reports under the heading of 'Parent', and for that reason, comparable figures are available for earlier years. The report on passenger air services is derived from the total air services figures by deducting cargo, mail and charter revenue and an arbitrary figure (based on IAFC suggestions) as expenses applicable to these revenue sources. For analysis purposes, the passenger air services report is of minimal use and the total air services figures are used in this submission.

TABLE VII.5-DETAILS OF ANSETT PROFITS, 1981-82 TO 1983-84

($ million)

Profit item	*1981-82*	*1982-83*	*1983-84*
Trading profits			
Airline activities			
Passenger trunk	25.0	14.7	37.2
Other passenger	5.1	0.4	5.5
Other activities[a]	0.1	3.4	-15.4
Total trading	30.2	18.5	27.3
Other income			
Dividends and interest	8.4	12.2	10.6
Associated companies	4.4	2.8	4.1
Other sources[b]	23.0	24.1	11.4
Total other	35.8	39.1	26.1
Operating profit before tax	66.0	57.6	53.4
Income tax	12.0	1.8	9.2
Net operating profit (as in Table VII.2)	54.0	55.8	44.2
Extraordinary income	3.0	-14.4	98.7
Profit available to shareholders	57.0	41.4	142.9

a. Calculated as a balancing item.
b. Includes capital profit on disposal of assets, abnormal items, and income from other sources.

Sources: Ansett Airlines of Australia (1982, 1983 and 1984a).

Ansett also provides two reports: one for trunk passenger air services and one for all passenger air services. The latter includes Ansett regional airlines (Air New South Wales, Airlines of Northern Australia, Airlines of South Australia and Ansett WA) as well as the trunk services. For this analysis, the figures are split into trunk and regional groups, where the regional numbers are taken as the difference between total and trunk route figures.

Table VII.6 presents basic financial data for the three airline groups; TAA total, Ansett trunk passenger, and Ansett regional passenger. This shows that TAA total services and Ansett trunk passenger services earn comparable levels of revenue, although TAA

TABLE VII.6-FINANCIAL DATA FOR TAA AND ANSETT AIRLINE ACTIVITIES, 1981-82 TO 1983-84

($ million)

Item	*1981-82*	*1982-83*	*1983-84*
Revenue			
TAA passenger	435	464	523
TAA total[a]	502	537	623
Ansett trunk passenger	537	553	601
Ansett regional passenger	98	113	122
Gross profit[b]			
TAA total	37.5	33.7	73.0
Ansett trunk passenger	88.1	84.5	142.8
Ansett regional passenger	8.1	10.5	16.9
Operating profit before tax			
TAA[c] total	-12.8	-26.5	17.0
Ansett trunk passenger	25.0	14.7	37.2
Ansett regional passenger	5.1	0.4	5.5
Total assets			
TAA[c] total	487	591	567
Ansett trunk passenger	564	723	787
Ansett regional passenger	69	86	87

a. Includes revenue from mail, freight and other airline related activities.
b. Gross profit is defined as revenue less operating expenses (other than depreciation and interest) or as operating profit before tax, plus interest and depreciation.
c. Altered to reflect the change in TAA accounting policy for interest payments.

Sources: Ansett Airlines of Australia (1982, 1983 and 1984a). Trans Australia Airlines (1982b, 1984b, 1984c).

revenue has grown faster (24 per cent over 2 years) than Ansett (12 per cent for the same period). The four Ansett regional airlines together earn about 20 per cent of the revenue of each of the trunk airlines and they too have recorded revenue growth of 24 per cent over the two years.

Gross profit for the two trunk operators fell in 1982-83, when passenger numbers declined sharply. This was followed by a very strong recovery in 1983-84. Ansett gross profits were about twice as large as TAA's for each year of the period and Table VII.7 shows that gross profit margins were also twice as high.

Both trunk and regional operations of Ansett earned a significantly higher return on assets than TAA. Furthermore, the return earned by Ansett trunk operations over the three years was much higher than that earned by the other activities of Ansett Transport Industries, and well above Australian industry as a whole. By any standards, there is strong evidence that Ansett trunk airline services are fundamentally highly profitable.

TABLE VII.7-FINANCIAL RATIOS FOR TAA AND ANSETT AIRLINE ACTIVITIES, 1981-82 TO 1983-84

(per cent)

Item	*1981-82*	*1982-83*	*1983-84*
Gross profit margin[a]			
TAA total	7.5	6.3	11.7
Ansett trunk passenger	16.4	15.3	23.8
Ansett regional passenger	8.3	9.3	13.9
Return on assets[b]			
TAA total	7.7	5.7	12.9
Ansett trunk passenger	15.6	11.7	18.1
Ansett regional passenger	11.7	12.2	19.4
Return on equity (pre-tax)[c]			
TAA total	..	..	16.3
Ansett trunk passenger	17.7	7.6	17.5
Ansett regional passenger	27.7	1.6	22.0

a. Gross profit margin is gross profit divided by revenue.
b. Return on assets is gross profit divided by year end total assets.
c. Return on equity is operating profit (pre-tax) divided by year end equity.

.. not applicable

Source: BTE estimate derived from Table VII.6.

Operating profit before tax follows a similar pattern to gross profit, with a fall in 1982-83, strong recovery in 1983-84 and Ansett well above TAA. In fact TAA's results in 1981-82 and 1982-83 were particularly bad, suggesting that some management decisions at that time were not optimal.

The pre-tax return on equity shown in Table VII.7 reinforces earlier comments on Ansett and TAA profitability. However, the Ansett figures may be distorted somewhat as Ansett air services are not operated by a separate company. It is therefore difficult to allocate a particular portion of Ansett Transport Industries shareholders' funds to the air services and the procedure followed by Ansett is to adopt the 70/30 debt/equity ratio proposed by the IAFC. This may not reflect the equity actually used in providing airline services. Ansett has also applied a standard tax rate of 46 per cent to its operating profit in its report to Parliament, whereas actual tax paid by Ansett was much lower, in part because of the investment allowance deductions permitted on recently purchased aircraft. For this reason, post-tax operating profit and return on shareholders' funds are not particularly meaningful[1].

Table VII.6 also shows the total assets employed by each airline and Table VII.8 provides details of the fixed assets as at June 1984. Over the two-year period, TAA assets grew by 16 per cent, although declining in value between 1982-83 and 1983-84. Ansett's trunk route assets grew by 40 per cent over the same period, to be 39 per cent, or $220 million higher than TAA's. Table VII.8 shows that Ansett employs almost exactly twice the level of fixed assets that TAA uses, to supply similar output in terms of available tonne-kilometres. Part of the explanation for this difference is that TAA's aircraft fleet is, on average, markedly older than Ansett's. Thus the original cost of TAA's aircraft is lower and the accumulated depreciation is higher. Furthermore, TAA's most recently delivered Airbus A300B is not included amongst its assets as this aircraft is leased, rather than owned, and is believed to be included in total future lease commitments for general plant and equipment. Ansett has also revalued some of its aircraft and property, which has served to increase the value of fixed assets. However, there may be some advantages to TAA in using older aircraft, as capital costs (depreciation and interest) are lower, although fuel costs and maintenance costs might be expected to be higher.

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1. In 1984 Ansett Transport Industries had a 76/24 debt/equity ratio, and had this been applied to airline activities, the pre-tax return on shareholders funds would have increased to 19.6 per cent

The TAA figure for other assets, primarily investments and current assets, is much higher than the Ansett figure. This reflects the Ansett decision to exclude certain items in these categories

TABLE VII.8-DETAILS OF ASSETS EMPLOYED BY TAA AND ANSETT TRUNK AIRLINE ACTIVITIES, 1984

($ million)

	TAA total air services		*Ansett trunk passenger services*	
Fixed assets				
Aircraft, engines and spares				
At cost	419		522	
Revaluation	-		80	
Accumulated depreciation	139		87	
Net value		280		515
General plant and equipment[a]				
At cost	64		110	
Accumulated depreciation	40		35	
Net value		24		75
Land and buildings[b]				
At cost	62		99	
Revaluation	-		14	
Accumulated depreciation	24		19	
Net value		39		94
Total fixed assets		342		685
Other assets		225		102
Total assets		567		787
Total future lease commitments				
Buildings		49		na
General plant and equipment		105		na
Total[c]		154		15

a. Includes plant, motor vehicles and furniture for Ansett.
b. Includes freehold and leasehold property.
c. Figures may not sum to totals due to rounding.

na not available
- nil

Source: Ansett Airlines of Australia (1984a). Trans Australia Airlines (1984c).

(following principles suggested by the IAFC for fare setting purposes) in their report to Parliament[1].

Projections of profitability

This section provides broad estimates of revenue, costs and profitability for the 1984-85 and 1985-86 financial years for TAA total air services and Ansett trunk passenger services. Inevitably such estimates are based on a variety of assumptions but for 1984-85 at least, most of these assumptions can be based on actual data for much of that financial year. The main assumptions for the 1984-85 estimates are as follows:

- average fare rise of 6 per cent, with no change in dilution patterns;
- an increase of 9 per cent in passenger-kilometres for Ansett, and 5 per cent for TAA[2];
- no increase in staff, but average salary and wage increases of 7 per cent for both airlines;
- the addition of one B767 to Ansett's fleet and the full-year lease cost of the fifth Airbus A300 for TAA;
- an average 10 per cent increase in fuel prices, reflecting virtually no increase for the first six months of the financial year and a sharp increase in the last six months;
- no change in actual fuel consumption as increased aircraft usage is assumed to be offset by the substitution of new fuel efficient aircraft for older, less efficient aircraft; and
- otherwise cost increases of around 10 per cent.

The resultant projections are presented in Table VII.9. They suggest that TAA revenue would rise by nearly 12 per cent and Ansett by nearly 16 per cent. As costs on average are rising at a slower rate of 8 per cent for the two airlines, the result is a substantial increase in operating profit for both. In TAA's case, the increase is from $17 million to $30 million, and for Ansett, from $37 million to $80 million.

This improvement in profitability could be expected to lead to significantly higher financial performance ratios of the type

1. This practice is adopted although there is no reason why figures used for fare setting need to be the same as those used for reporting purposes.
2. TAA was badly affected by an engineers strike in December 1984.

TABLE VII.9-PROFIT PROJECTIONS FOR TAA AND ANSETT TRUNK SERVICES, 1983-84 TO 1985-86

($ million)

Costs	*TAA total air services*			*Ansett trunk passenger services*		
	1983-84	*1984-85*	*1985-86*	*1983-84*	*1984-85*	*1985-86*
Revenue	623	695	780	601	695	750
Costs						
ANCs	30	35	40	30	35	40
Payroll costs	209	225	250	196	210	225
Depreciation	30	30	30	47	50	50
Interest	26	25	25	59	65	65
Fuel and materials	148	165	185	164	180	195
Aircraft hire and lease	22	30	30	-	-	-
Other	141	155	175	68	75	80
Total	606	665	735	564	615	655
Operating profit before tax	17	30	45	37	80	95

- nil

Source: BTE estimates based on assumptions in text; numbers rounded to nearest $5 million in 1984-85 and 1985-86.

presented in Table VII.7. Return on equity, in particular, could be around twice as high as the 1983-84 level for both TAA and Ansett, and the 1983-84 level itself illustrated that the airlines are highly profitable.

The projections for 1985-86 are much less reliable than those for 1984-85. They are based on a further 12 per cent increase in revenue for TAA and 8 per cent for Ansett[1]. These rises are accompanied by similar increases in most cost items, reflecting both increased activity and higher price levels. However, it is also assumed that there are no further fleet changes, so that depreciation, interest and aircraft hire and lease expenses do not change. This implies that increases in passenger demand are essentially accommodated by way of higher load factors and higher aircraft utilisation. The results of the 1985-86 projections are that TAA profits on airline operations are expected to rise to $45 million, while Ansett profits may reach $95 million.

It is obvious that the projections discussed in this section are dependent on the assumptions made. The increases in traffic, fares, wages and fuel prices are generally based on observed trends for the nine months to March 1985, some of which are reported elsewhere in this submission. However, there are other reasons why actual profit might vary from the projections other than the assumptions proving incorrect. It is possible that higher air freight rates (DofA, March 1985) might serve to improve profitability, at least for TAA. On the other hand, interest costs could increase sharply because of the recent devaluation of the Australian dollar, to the extent that borrowings are from overseas and are not hedged for exchange rate fluctuations. Similarly, the airlines may face substantial exchange losses, as abnormal or extraordinary items, on the outstanding principle sums of their overseas loans.

Nevertheless, it seems that both airlines can expect in 1984-85 to earn about twice the operating profit they earned in 1983-84, and to earn higher profits again in 1985-86. Furthermore, there are reasonable prospects that Ansett's trunk route operating profit would reach $95 million in 1985-86, and TAA's $45 million.

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1. A higher increase has been allowed for TAA on the basis of TAA recovering its previous market share.

APPENDIX VIII-THEORY OF CONTESTABLE MARKETS

INTRODUCTION

This appendix briefly describes a relatively new theory of industry behaviour, the theory of contestable markets, how it relates to traditional theory and its application to the US airline industry.

The traditional theory of industry behaviour emphasises the importance of industry structure in determining the output, prices, profits and overall efficiency of a particular industry. Although industry structure is composed of a number of elements, the major differences in the economic effects of the four basic theoretical models are accounted for by the number of firms operating in an industry. The importance of this factor was discussed in Chapter 4 where such matters as economies of scale, barriers to entry and the possibilities for mergers and acquisitions are shown to have a bearing on industry structure, essentially by determining the number of firms in the industry.

A relatively recent development in the theory of industry behaviour, the theory of contestable markets, has laid less emphasis on the number of competing firms and assigned the key role to the entry and exit conditions of an industry. The theory asserts that the number of competing firms has little bearing on the level of efficiency in an industry. Rather, it is the ability of firms from outside an industry to contest for a market, and to exit a market without any cost penalties, that provides the competitive conditions required for an efficient outcome.

The theory of contestable markets is considered by its proponents to be particularly applicable to the airline industry. The theory's application to the US airline industry and its possible application to an unregulated Australian market are considered following a discussion of the theory.

CONTESTABILITY THEORY

The theory of contestable markets first attained prominence in the late 1970s and early 1980s (Panzar and Willig 1977, Baumol, Panzar and Willig 1982, Baumol 1982), and was particularly aimed at analysing markets that possess economies of scale but are nevertheless characterised by easy entry and exit conditions. Any market in fact is considered vulnerable to competitive forces provided that entry is absolutely unrestricted and exit is absolutely costless, and that all firms have equal access to available technology and factors of production.

Contestability theorists thus do not regard economies of scale as a barrier to entry (even in the extreme case of a natural monopoly) unless the large fixed costs normally associated with scale economies also happen to be 'sunk' costs - defined as costs which must be borne by a potential entrant which do not again have to be paid by incumbent firms. The requirements of some industries will be such that production involves specific assets which cannot be easily transferred to other industries or sold without cost, so that capital is irretrievably committed to producing a particular product. The firm's expenditure on such assets is a fixed cost, and also a sunk cost.

If an industry possesses large sunk costs this will be a substantial barrier to entry and exit. Not only is the potential entrant faced with a large amount of expenditure to pay for fixed costs, but it is also faced with the knowledge that this expenditure cannot be easily recovered from that particular industry without financial loss should the firm wish to subsequently exit the market.

For a market to be contestable a firm must be able to enter and exit an industry without cost, and it is therefore vital that the assets required by firms in the industry are highly mobile. In the airline industry, for example, contestability theorists argue that airline capital costs, while substantial, are not sunk costs, as the major capital item (the aircraft) is in fact mobile from market to market.

In essence, the ability of a potential entrant to contest a market depends upon that particular industry's vulnerability to 'hit and run' entry. A perfectly contestable market exists when a new firm can exploit a transitory profit opportunity by entering an industry, collecting its profits and exiting before the incumbent firms (whether one or many) have a chance to react.

The perfectly contestable market is a limiting case of the theory requiring exacting conditions:

- Entry into the industry is unrestricted and without limit. There are no costs or lags involved with entry and the potential entrant can match all dimensions of technology, size, product loyalties and other advantages of existing firms. This condition ensures that the entrant can immediately duplicate any existing firm.
- The pricing practices of the market must be such as to allow an entrant the prospect of profit. This price sustainability condition means an entrant can establish itself (and, indeed, exit) before an existing firm makes any price response (or that consumers in the market can be induced to switch their demand to the new firm with a shorter reaction time than the incumbents).
- Entry is perfectly reversable. The entrant can exit without incurring any loss because sunk cost is zero.

A 'contestable' market or an 'almost contestable' market are not so easily defined. The usefulness of the theory in circumstances when the conditions for perfect contestability do not exist is discussed below.

EFFICIENCY CONSEQUENCES OF THE THEORY

A critical characteristic of a perfectly contestable market, and one which proponents of the theory argue makes the theory particularly applicable to natural monopolies, is that potential entry disciplines behaviour as effectively as actual competition within the industry. The unrestricted entry and exit conditions in a perfectly contestable market ensure that the mere threat of entry induces the incumbent firm(s) to behave in a highly competitive manner. Excess profits or technical inefficiency would be an invitation to new firms to enter the market.

If a market can be freely contested the industry will behave competitively no matter how few firms are actually operating. Proponents of the theory argue that the efficiency consequences of a perfectly contestable market would be similar to those of perfect competition, namely:

- firms in the industry earn only normal profits in long-run equilibrium; all monopoly profits are eliminated so as to make new entry unattractive;

- price cannot exceed marginal cost in the long-run if the industry contains two or more firms, as any deviation of price from marginal cost will attract new firms[1]; and
- firms in the industry are likely to be technically efficient as the incentive to minimise costs will be strong; any production inefficiencies would be an invitation to enter the market.

The efficient outcome of a perfectly contestable market reflects the exacting conditions necessary for its existence and, as with perfect competition, this raises the problem of how useful the theory might be if the conditions on which it is based prevent such a market existing in the real world.

The proponents of contestability theory assert that where the conditions necessary for a perfectly contestable market are violated to some extent, a market, while no longer 'perfectly contestable', may still be 'contestable' or 'almost contestable'. In such circumstances the predictions of the theory will remain reasonably accurate. Thus, it is argued that the behaviour of firms and the benefits to society continuously approach those consistent with perfect contestability as the contestability of markets increases, and that in the real world a reduction of barriers to entry and exit (to make markets more contestable) yields steady improvements in industry performance and behaviour (Baumol et al 1982).

USEFULNESS OF CONTESTABILITY THEORY

The novel elements of the theory are claimed to be the emphasis on the freedom to exit an industry and the demonstration that potential entry can force the incumbents of an industry to behave in a competitive fashion. The theory has been deemed particularly relevant for markets tending towards natural monopoly, where there is little (if any) actual competition, and where there is an expectation of monopoly profits. If such a market is also contestable or can be made contestable (by appropriate public policies), the community can theoretically gain from the benefits of scale economies without incurring the normal adverse effects associated with market power such as high prices, pure profits and efficiency losses.

The policy implications of the theory follow on logically from the perceived desirability of contestable markets and revolve around

1. The monopolist may represent a special case whereby price could be set above marginal cost under certain circumstances.

preventing restrictions on entry and exit, including government regulation. If, on investigation, an industry displays little evidence of being contestable it would be appropriate for the public authorities to implement measures that would increase the degree of contestability by:

- removing any government regulations preventing access to the industry, or preventing price competition in the industry;
- actively encouraging unrestricted entry into and exit from the industry by, for example, ensuring price flexibility; and
- addressing large sunk cost problems where they exist, for example, through the public provision of sunk facilities, or by ensuring access for new or potential entrants to sunk facilities.

If, on the other hand, an industry is judged to be highly contestable there is little need for any government regulation, at least on efficiency grounds. This applies to all varieties of industry structure, from natural monopolies which previously (on the basis of traditional theory) it had been considered essential to regulate, to industries containing numerous producers.

Proponents of the theory regard the deregulated US airline industry as highly contestable. Therefore, in the absence of government regulation, a highly efficient outcome can be expected, regardless of the number of firms actually operating in the industry.

CONSTRAINTS AND CRITICISMS OF THE THEORY

The pure theory of contestable markets has been criticised on two major grounds. Firstly, the concept of perfect contestability requires implausible conditions that have no relevance in the real world. Secondly, the applicability of the theory to markets where such extreme conditions do not exist is severely limited.

A number of authors have questioned the conceptual issues involved in the theory (for example, Schwartz and Reynolds (1983), Shepherd (1984), and Weitzman (1983)). The arguments employed by such critics are in some cases of a technical nature and involve lengthy discussion. Briefly, however, the major criticisms can be summarised as follows:

- The theory is only applicable to perfect market structures.
- The notion that an entrant can enter instantaneously at any scale

is unrealistic, as typically there will be set-up costs, problems in transferring capital and an inability to match an incumbent's output completely.

- The notion that an entrant can undercut an incumbent's price and exit without loss before the incumbent can adjust price has several problems. In practice, incumbents in most industries have generally been found to be typically able to adjust prices and output rapidly in response to entry. In addition, the theory requires that consumers' reaction to a price reduction must be quicker than the incumbents' reaction; however, the existence of brand loyalty and consumer ignorance makes this assumption highly implausible.
- There will almost always be some sunk costs in an industry, because there are specific assets which cannot be transferred or sold costlessly, implying that entry cannot be perfectly reversable.
- Contrary to the predictions of the theory, fixed costs associated with scale economies, which are not also sunk costs, may still constitute a barrier to entry. That is, unless an entrant can match an incumbent's output completely, the entrant's fixed cost per unit is higher, and this constitutes an entry barrier.

It was noted above that the proponents of contestability theory maintain that the unrealistic nature of perfectly contestable markets does not diminish the theory's general usefulness. They argue that, as with perfect competition, perfect contestability is an ideal and thus an extreme case with optimal efficiency consequences and a standard for other market types. Critics of the theory assert, however, that small deviations from the conditions necessary for perfect contestability do not result in only small deviations from optimal efficiency, and anything less than the assumption of totally unrestricted entry and absolutely costless exit renders the theory inoperable, or at best indeterminate.

Schwartz and Reynolds (1983) argue that once a slight deviation from the strict assumptions of perfect contestability occurs, pricing and entry decisions depend upon the nature of firm interactions (as in oligopoly theory). Consequently, they add, the notion that the economic consequences of almost perfectly contestable markets approximate those of perfectly contestable markets remains to be proven. Shepherd (1984) argues that under any departures from the pure conditions, contestability analysis becomes speculative and little different from conventional theory on entry barriers. Weitzman

(1983) denies that, in the absence of sunk costs, contestability theory is applicable to cases of natural monopoly and other forms of imperfect market structure because the theory implies the existence of constant returns to scale.

APPLICATION OF CONTESTABILITY THEORY TO AIRLINE MARKETS IN THE UNITED STATES

Application of the theory of contestable markets to the deregulated US airline industry[1] suggests that competitive forces will produce an efficient outcome in the airline market, even in circumstances where natural monopolies exist on some routes.

The argument that a high degree of contestability exists in the US airline industry and that, consequently, behaviour in the industry is consistent with that implied by the theory, rests on a number of propositions, namely:

- Entry into the industry is relatively easy. Entrants can duplicate the operations of existing firms by providing appropriately sized aircraft and by obtaining facilities at airports.
- Sufficient pricing flexibility exists so that potential entrants can undercut incumbent firms.
- The price adjustment lag faced by incumbent firms exceeds any entry and exit lag of the potential entrant.
- Sunk costs are small and thus not a major barrier to entry or exit.

Entry into the US airline market now appears to be free of virtually all legal constraints and there are few remaining barriers to entry. Aircraft are individually costly but this cost is not very important as an entry barrier to particular routes (although it would clearly be an important consideration if a potential entrant was looking at the US market as a whole and the prospect of obtaining a fleet of aircraft). The need for access of new firms to airport facilities has put pressure on available airport gates and slots. In addition, a number of environmental and local factors at some airports have resulted in market imperfections; for example, potential entrants are not always guaranteed access to particular routes. Nevertheless, air

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1. For a discussion of the theory in relation to the US airline industry see, for example, Meyer and Oster (1984), Bailey and Panzar (1981), Bailey (1981), Bailey, Graham and Kaplan (1983).

traffic has expanded rapidly since deregulation and available evidence suggests that new entry of airlines at airports has been accommodated fairly well.

There is no question that the fare structure in the US airline industry is sufficiently flexible for new entrants to undercut existing firms if they so desire. Since deregulation, airlines no longer have to set equal rates for flights of equal distance, and consequently a wide range of different fares have emerged, including discounts, promotional fares, reduced off-peak fares, etc. Such price flexibility gives scope for potential entrants, but it may also work to their disadvantage if the incumbent firms on particular routes are also 'price flexible'. Critics of contestability theory point out that price rigidity by incumbent firms is not a feature of the deregulated US airline industry, and that existing airlines can and do immediately match the fares of new entrants. In numerous cases, in fact, incumbent firms have not even waited for actual entry but have announced that they will match the fares of any new entrants.

The apparent price flexibility of incumbent firms in the US airline industry raises another problem for the contestability theorists - the relationship between the price adjustment lag of incumbents and the entry lag of potential entrants. The existence of any degree of 'brand loyalty', coupled with an imperfect information process, implies that new firms have to allow some time to establish themselves in a market and may thus be at a considerable disadvantage in the interim period. Thus, even if an entrant undercuts an incumbent's price, consumers may still patronise the incumbent because its schedules and/or service reliability are better known than the entrant's. Once the entrant has been in the market for a while, of course, customers may switch their custom, but in the meantime the 'contesting' of the incumbent's market may not be very effective. Evidence on entry lags in the US airline market suggests that shifts in custom do not appear to have been instantaneous and new firms (like new firms almost anywhere) have taken time to build up patronage.

Contestability theorists appear to be on firmer ground in arguing that the US airline operators face low sunk costs. The major capital costs facing entrants, the aircraft, are not sunk costs but are mobile from market to market and can be easily re-sold. The principal sunk cost in the airline industry is the cost of airport plant such as runways and control towers, which is usually incurred by the public sector and not the airlines. Although the US authorities often seek to underwrite the sunk costs by leasing arrangements, an active sub-lease

market for new entrants minimises the barrier to entry characteristics of the sunk facilities.

In summary, some of the requirements of a contestable market (low sunk costs, unrestricted entry and relatively costless exit) are evident in the US airline industry but the existence of others (price rigidity of incumbents, low entry lag) is less evident.

A major difficulty is that there does not exist a precise way of empirically determining how contestable a market is or, indeed, whether it is contestable at all. However, the proponents of contestability theory argue that factor mobility, available equipment and the ease of entry into and exit out of US airline markets indicate that potential entrants can readily respond to a potential profit opportunity. Consequently the airline market is deemed 'sufficiently contestable' for the behaviour of the industry to be consistent with that implied by the theory.

The testing of the theory in the US has been considered in the context of potential entry and its effect on market behaviour. The deregulated airline industry has displayed rising competition, resulting in innovative pricing and route planning, but this does not singularly support contestability theory as the conventional theory of market structure would also indicate such results. However, contestability theorists view each particular route as a relevant (sub) market. Each airline's addition of a route is entry into a new market, and thus established airlines all act as potential entrants into each other's routes. The key claim of contestability theorists is that potential competition in US airline markets has disciplined monopolists on particular routes to behave in a competitive manner. The threat of entry to particular routes can potentially come from both established airlines and new entrants to the industry.

CONCLUDING COMMENTS

The theory of contestable markets provides important insights into the efficiency consequences of market structures and suggests practical policy guidelines for governments.

Although perfect contestability may be unattainable in the real world (as is perfect competition), there appear to be similar benefits to be gained from making a market 'more contestable' as there are from making a market 'more competitive'. This conclusion has major implications for the economic rationale for regulation. If a

government wishes to improve the allocation of resources in a particular market, and so achieve a more competitive outcome, it may be able to achieve this objective and avoid all the possible 'costs' of regulation by taking steps to ensure the market is contestable.

The theory of contestable markets has been considered particularly apt for markets (or sub-markets) tending towards natural monopoly; a phenomenon that has in the past provided justification for government regulation restricting the entry of new firms. According to contestability theory there is no requirement for any government restrictions on entry into such markets provided the market is characterised by easy entry and exit, or the government can find practical solutions to making the market contestable, in which case the threat of entry alone should be enough to prove an effective market discipline.

Similarly, the theory suggests that outside the special case of natural monopoly, a government concerned with economic efficiency will still be well served by focussing on entry and exit conditions to a market as well as the actual number of firms in the market and their economic behaviour.

The novel elements of contestability theory, namely, the emphasis on the costless exit of firms from an industry and the important effects attributed to the threat of entry of new firms, were in fact also recognised by traditional theory as affecting market structure. However, while acknowledged, these elements were never stressed in traditional theory and consequently never received the policy pre-eminence attached to them under contestability theory. A government concerned with efficiency in particular industries may now be advised of the need for possible policy action in important areas, for example:

- seeking out and encouraging potential competitors
- ensuring equal access to technology
- encouraging price flexibility
- addressing sunk cost problems.

The application of contestability theory to the US airline industry has some implications for Australia. Although the size of the US market is much greater, similar conditions regarding sunk costs and ease of entry and exit would appear to apply in an unregulated Australian airline market. In addition, not all routes in the US are dense trunk routes with large numbers of customers; some sub-markets

with a relatively small population may well duplicate conditions in Australia. Thus, where economies of scale may imply that some routes in an unregulated Australian market will be only served by one airline, contestability theory suggests that potential entry will discipline the behaviour of that airline. This means that it will act in a competitive fashion so as not to become vulnerable to competitive entry.

APPENDIX IX-UNITED STATES ROUTES USED FOR FARE COMPARISONS

This appendix provides details of the US fares and routes used in the comparison of Australian and US domestic air fares in Chapter 3.

Table IX.1 provides information on the range of economy air fares[1] for the 36 US city pairs used in the Chapter 3 comparison. The routes were chosen to provide a broad geographical distribution of short, medium and long-haul routes as developed in a study by Eriksen, Scalea and Taneja (1976). The routes are also representative of a range of competitive conditions as indicated by the number of airlines operating on each route.

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1. The range of US economy fares includes Coach Economy Class Y and the Coach Economy Discounted Classes B, M, Q and T. These fares are generally free of the restrictions that apply to Advance Purchase, Overnight Travel and Standby fares.

TABLE IX.1-UNITED STATES ECONOMY AIR FARES, 36 SELECTED US CITY PAIRS, MARCH 1985[a]

Route	Distance (km)	Number of airlines operating on route	Range of economy fares (US$)		
			Highest economy	Lowest economy	Lowest discount economy
Lincoln-Omaha	80	2	..	64.89	27.78
Norfolk-Richmond	121	3	66.67	45.37	36.11
Cleveland-Detroit	150	8	74.07	35.19	60.19
Bismark-Minot	171	1	..	69.44	..
Albany-New York	229	8	125.00	54.63	41.67
Fargo-Minneapolis	359	2	..	61.11	..
Cincinnati-Nashville	370	2	..	126.85	92.59
Dallas-Houston	372	6	115.74	112.04	..
Kansas City-St Louis	383	6	144.44	104.62	36.11
Cincinnati-Pittsburgh	414	1	..	110.19	..
Houston-New Orleans	499	4	101.85	92.59	..
Knoxville-Memphis	550	3	135.19	125.93	..
Las Vegas-Reno	555	4	150.93	91.67	74.07
Atlanta-Cincinnati	602	1	..	167.59	..
Las Vegas-San Francisco	666	5	164.81	111.11	92.59
Chicago-Omaha	668	3	179.63	156.48	91.67
Atlanta-New Orleans	674	3	..	175.93	..
Dallas-Memphis	689	4	174.07	147.22	..
Oklahoma-St Louis	744	1	..	175.93	..
Chicago-Rochester	850	3	109.26	107.41	..
Atlanta-Detroit	970	4	..	224.07	128.70

TABLE IX.1 (Cont)-UNITED STATES ECONOMY AIR FARES, SELECTED 36 US CITY PAIRS, MARCH 1985[a]

Route	Distance (km)	Number of airlines operating on route	Range of economy fares (US$)		
			Highest economy	Lowest economy	Lowest discount economy
Denver-San Diego	1 350	2	..	245.37	97.22
Phoenix-San Antonio	1 355	1	..	294.44	..
Miami-Washington	1 498	5	267.59	110.19	110.19
Detroit-Houston	1 764	3	..	277.78	..
Kansas City-New York	1 775	4	268.52	259.26	119.44
Cleveland-Denver	1 949	3	..	287.96	120.37
Houston-Washington	1 957	5	..	287.96	..
Chicago-Tucson	2 311	3	..	329.63	229.63
Kansas City-San Francisco	2 406	3	330.56	300.93	125.00
Las Vegas-New Orleans	2 420	3	..	333.33	91.67
Dallas-Portland, Or.	2 609	2	..	350.93	..
Denver-New York	2 617	6	335.19	138.89	138.89
St Louis-San Francisco	2 787	1	..	363.89	..
Los Angeles-Miami	3 763	3	423.15	413.89	222.22
Portland, Or.-Washington	3 769	3	..	337.96	208.33

a. Economy fares are the United States Coach Economy Class (Y) and Coach Economy Discounted Classes (B, M, Q and T).

.. not applicable

Sources: ABC World Airways Guide (1985). OAG (1985).

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ABBREVIATIONS

ANA	Airlines of Northern Australia
ANRs	Air Navigation Regulations
APEX	Advance Purchase Excursion Fares
ASA	Airlines of South Australia
ATK	Available tonne kilometres
AWA	Airlines of Western Australia
BTE	Bureau of Transport Economics
CAB	Civil Aeronautics Board
DofA	Department of Aviation
DoT	Department of Transport
DCA	Department of Civil Aviation
IAFC	Independent Air Fares Committee
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
PWA	Price Waterhouse Associates
RPK	Revenue passenger kilometres
RPT	Regular Public Transport
TAA	Trans Australia Airlines
US	United States