The Progress of Aviation Reform

Report

This Report is the fifth of a series of publications monitoring the progress of aviation reforms which the Bureau of Transport and Communications Economics has produced since 1989. Earlier reports concentrated on domestic airline deregulation, but clearly the distinction between domestic and international has now blurred. Accordingly, this report has a broader focus in covering some of the wider aspects of aviation reform and the changes which have occurred so far in the structure, conduct and performance of the Australian aviation industry, as well as examining in depth the net welfare gains from domestic deregulation.

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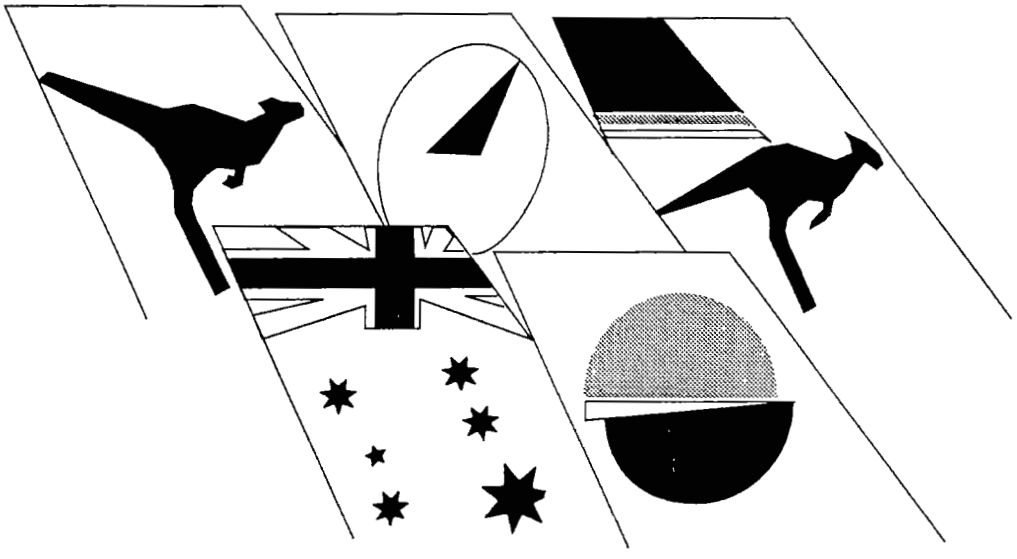
THE PROGRESS OF AVIATION REFORM



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FOREWORD

While micro-economic reform has altered almost every facet of Australia's economy, the aviation industry is one industry among those which have faced the greatest pressures to change. As this report shows, the industry has been subject to reform pressures almost continuously since 1987. The report details the results from reform, in terms of the changes which have occurred in industry structure, in conduct, including the reductions in prices and improvements in services to airline passengers, and in industry performance, including the net welfare gains from reform.

This report endeavours to cover all these aspects of the government's reforms to Australia's aviation industry. It continues on from a series of studies which the Bureau has produced on the transition of domestic aviation to a deregulated industry, and will complement forthcoming Bureau studies on trends in international aviation and the general aviation industry. The Bureau will continue to monitor the progress of aviation reform with a view to considering whether the industry is structured optimally for competitive conduct and best practice performance.

The study team for this report was led by John Street. Substantial contributions to the analysis, figures and report writing were made by David Smith, Pip Spence, John Street and Norm Wuest. Mick O'Halloran contributed through the use of the Bureau's Aerocost model. Jean Penny drew the organisation charts and Jo Blanchard drew the maps and front cover. Maureen Wright edited the final draft and Chi Nguyen was responsible for typographical composition. Peter Hoss of the Department of Transport and Communications Aviation Statistics section was very helpful in the provision of aviation statistics.

The Bureau especially wishes to thank Professor Curtis Grimm of the School of Business and Management at the University of Maryland for refereeing the paper, and Hugh Milloy, who was Research Manager at the inception of this study, and who made valuable comments on the draft.

Sue Elderton
Research Manager
Aviation and Safety Branch

Bureau of Transport and Communications Economics
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ABSTRACT

The reform of Australia's aviation industry has been an ongoing process, with five major reform initiatives undertaken since 1988. This study examines how the aviation industry has reacted to reform in terms of the structure of the industry and the conduct and performance of the major players.

The changes in the industry structure over the last five years resulting from the reform process have not been large in terms of the number of market participants or changes in route structure. Moreover, the available evidence suggests that the scope for entry at a major level into the Australian domestic market is limited. However, there has been considerable structural change in that there is now greater freedom of entry to and exit from the market and greater freedom for airlines to compete against each other, freedoms which have generated substantial changes in the conduct of firms and the performance of the airline industry.

An increase in competition has been a consistent aim of Australian Government reforms and this has most definitely been achieved. Competition has been the key to stimulating the industry to provide better services at the lowest possible price. The key aspects of service quality have consistently either improved or remained constant over the post-deregulation period examined. In addition, domestic air travel has on average become cheaper since deregulation. These things have been true even at times and on routes not served by Compass.

Industry and airline performance has been mixed. The overall winners have been airline passengers, while airlines have lost profits, and employees have less employment security. Calculations of economic welfare, however, show that the gains are clearly larger than the losses, to the extent of some $100 million per annum.

Overall, the impression is one of progress. Australian aviation reform is on target to achieve an improvement in the overall efficiency of Australia's airline system and contribute to our international competitiveness. The effects of the reforms undertaken so far have not fully worked themselves out and it is our judgment that their effects are likely to be felt through to the turn of the century.

SUMMARY

This report is the fifth of a series of publications monitoring the progress of aviation reforms which the Bureau of Transport and Communications Economics has produced since 1989. Earlier reports concentrated on domestic airline deregulation, but clearly the distinction between domestic and international has now blurred. Accordingly, this report has a broader focus in covering some of the wider aspects of aviation reform and the changes which have occurred so far in the structure, conduct and performance of the Australian aviation industry, as well as examining in depth the net welfare gains from domestic deregulation.

STRUCTURE

The reform process

In recent years there have been three major changes to aviation policy in Australia. These are contained in the Evans statement of 1987, the Willis statement of 1989, and the Collins statement of 1992. In addition, there has been the Evans statement of 1988, *Reshaping Transport and Communications' Government Business Enterprises*, and the joint communique on air services between Australia and New Zealand.

In 1987 Senator Gareth Evans, then Minister for Transport and Communications announced the Australian Government's decision to withdraw from economic regulation of domestic interstate aviation from October 1990, thus ending the 'two airlines policy' which had dominated domestic aviation for over thirty years. The objective of deregulation was to create an environment that would foster increased responsiveness by domestic airlines to consumer needs, and greater economic efficiency in the industry.

In 1989 Ralph Willis, then Minister for Transport and Communications, announced reforms in the government's international aviation policy, outlining a new approach in negotiating Australia's international Air Service Agreements. As a result of an upsurge in inbound tourism in the mid 1980s and, to a lesser extent, global trends in international aviation, Qantas' interests had ceased to be the key determinant in the negotiation process. Instead Air Service Agreements were to be negotiated with the aim of maximising the welfare of the users and of Australia as a whole.

In 1992, Senator Bob Collins, Minister for Transport and Communications, announced further policy developments which built on the foundation established by the earlier statements. In particular, his announcement heralded the removal of some of the barriers between the domestic and international aviation markets.

In addition to these key policy developments the aviation industry has been affected by government business enterprise reform, which included the establishment of the Federal Airports Corporation and the Civil Aviation Authority. Review of government involvement in its two airlines led to the sale of Australian Airlines to Qantas and approval for 100 per cent privatisation of the new enterprise, 25 per cent of which was purchased by British Airways in March 1993.

The industry

Australia has two major domestic airline groups, Ansett and Australian, providing comprehensive network coverage on the major domestic routes. One new major airline, Compass, entered the domestic market in December 1990, collapsed in December 1991, re-entered the market in August 1992 under new ownership and management and collapsed for the second time in March 1993.

So far Australia has one international carrier, Qantas, while Ansett is 'designated' for some routes. Other carriers, including Ansett, are gearing up to contest the international market, and Air New Zealand has announced its desire to provide domestic services in Australia.

While at this very basic level of industry structure, that is, the number of market participants, it appears that there has been little change, it can be argued that the situation has indeed changed radically since 1987. The difference lies in freedom of entry to and exit from the market and in the greater freedoms which now exist for established airlines to compete against each other. However, there is still not complete freedom. Certain intrastate airline markets are still regulated; foreign airlines, with the exception of Air New Zealand by November 1994, are not permitted to provide domestic scheduled services in Australia; and international airline freedoms are constrained by the bilateral process of negotiating market access. Nevertheless, the regulatory changes which have occurred have radical implications for industry conduct and performance.

Qantas has announced its intention to build a seamless airline service. This would provide, for the first time, convenient physical and timely connections between domestic and international services for both inbound and outbound international travellers. However, considerable investment and planning are required to achieve this vision. Ansett plans to follow suit with connections to New Zealand and Southeast Asia from its existing terminals.

Both Qantas and the Ansett group are much more than mere airline companies. They each have significant interests in travel agencies and tour packaging, resorts and hotels, express air freight and computer services. Ansett is the most diversified, with approximately 40 per cent of its revenues being derived from sources other than airlines. The interests which both groups hold in inputs to airline services, such as travel agencies and computer reservations systems, in a horizontal spread of airlines, regional, domestic and international, and in tourism-related businesses (hotels, resorts, tour packaging), are relevant to their ability both to compete through providing what the customer wants and to exercise market power.

Unlike the United States deregulation experience, the major airlines' route structures within Australia have not changed radically since regulatory reform. Part of the explanation lies in the fact that the nature of the regulatory regimes were different. The United States airline regulatory regime was proscriptive regarding route entry, whereas Australia's was not. Further explanation lies in the concentrated nature of the Australian domestic air passenger market, the top twenty routes accounting for some 80 per cent of all passengers.

Three areas which have come under scrutiny, in efforts to improve airline performance since the process of aviation reform began, have been labour force productivity, aircraft utilisation efficiency and redundancy in aircraft maintenance facilities. There has been considerable labour shedding and rationalisation of maintenance facilities, while, at the same time, the airlines have been expanding outputs and managing a process of fleet expansion and modernisation, partly through aircraft purchases and sales and partly through lease agreements.

Airline economics and scope for entry

Airline industry outcomes are determined through the interactions of supply and demand forces. As these forces ultimately determine industry structure — which, in turn, influences the conduct of industry players and thus their performance — it is important to understand how these forces work.

Supply. On the supply side of airline economics there was a traditionally held view that airlines, at least in Australia, were a natural monopoly. According to this belief, unit costs would decrease as airline size increased and competition would not survive. Yet despite numerous attempts to find evidence to support this proposition, the results have been inconclusive. However, certain cost relationships have been found to exist for some elements of airline operations. These include:

- cost per seat generally declines with increasing size of aircraft;
- cost per kilometre flown declines with increasing stage length;

- cost per passenger declines as the load factor increases towards 100 per cent;
- cost per passenger falls as an airline delivers more passengers within a network of given size (referred to as economies of traffic density);
- costs are constant with respect to changes in other parameters of airline size; and
- costs per passenger increase with improvements in certain dimensions of service quality.

Some of these elements, such as economies of stage length, are important in determining passenger fares on a particular route, but do not affect the relative costs of airlines competing on the same route. The implications of the availability of economies of traffic density, however, are quite different as they are the closest approximation of a size economy available in the airline industry. If an airline is to successfully compete in a market, it must have at least as much density as its competitors, otherwise it will be at a cost disadvantage. Traffic density therefore is the only supply-side characteristic of the industry that has implications for the number of carriers within a market.

Demand. If an airline fails to consider the nature of the consumer's wants and needs, control over the costs of production will not necessarily result in the survival of the airline. In general it has been concluded that airline consumers prefer airlines with a large network, prefer to travel with a single airline on any one journey, and are highly responsive to airline loyalty schemes. However, demand for airline services is not homogeneous. While demand for leisure travel is highly sensitive to price, demand for business travel is relatively insensitive to price but highly sensitive to the quality of airline service. As a result of this heterogeneity in demand, airlines have been able to practise price differentiation among categories of travellers.

Barriers to entry. The possibility that strong brand loyalties or ownership of key airline inputs (for example, travel agencies, computer reservation systems and airport terminals) constitute barriers to entry for new airlines has been raised in the context of both Compass Mk1's and MK2's ability to compete in Australia's domestic aviation industry. However, apart from Compass complaints about travel agent bias, which remain to be proved, there is no evidence to suggest that the other potential barriers to entry were critical to the collapse of Compass Mk1 or 2.

Scope for entry. The available evidence suggests that the scope for entry into the Australian domestic airline market is quite restricted. Demand factors and economies of route density appear to be powerful forces favouring the long-term survival of large airlines. A major new entrant would need to be large in terms of network size, to satisfy to consumer demands, and route density, to realise cost economies. A new entrant would also need to be

sufficiently well financed to cover start-up costs including a loss-making period while brand loyalties are established.

There may also be scope for a new entrant to enter the market as a smaller operator. As trunk carriers typically manage their regional feeder airlines as independent concerns, possibly as a result of differences in service levels and labour markets and a desire to minimise their number of aircraft types, there could be scope for competition in this sector of the market. In addition, there may still be scope for 'niche' carriers if they are able to sufficiently differentiate their product or get access to inputs at a lower cost than their competitors.

Industry structural developments

Compass. Compass Mk1 ceased operations on 20 December 1991 and Compass Mk2 ceased operations on 12 March 1993.

There were a number of common contributing factors to the collapses of both airlines, but also some significant differences. The major causes of the airlines' difficulties were lower than anticipated yields and higher than anticipated start-up costs leading to critical liquidity crises. Both airlines had lower than anticipated yields because, among other things, they failed to capture a significant amount of the business travel market. Both airlines faced unforeseen start-up costs which drained them of working capital. Both airlines could have wished for more buoyant economic conditions to improve the spending power of potential travellers and hence the size of the domestic passenger aviation market at any given level of prices and service quality. As it was, Australia's airlines have had to cut fares simply to maintain passenger numbers, and even more deeply in order to attract the record number of passengers which have been carried.

Compass Mk1 was subjected to severe start-up glitches, not entirely under its control, such as late delivery of aircraft and the failure of its telephone reservations system to cope with demand.

Access to appropriate terminal facilities has also been identified as crucial to the development of aviation in a deregulated environment and a factor in the inability of new entrants to compete effectively. However, strategies which the airlines adopted in their entry to the market and in the marketing of their services appear to have been significant contributing factors to their demise — suggesting that Compass may not have survived even if other conditions had been favourable.

Compass Mk1 chose to compete head-on with the incumbent airlines, offering large expansions to capacity on the major routes, and was a price leader, whereas Compass Mk2 adopted a less aggressive profile, but both appeared to underestimate their relative disadvantage in competing for passengers, particularly full fare passengers. Because of its large planes, Compass Mk1

was not offering improvements in service frequency commensurate with the number of seats it had available. Many business travellers found Compass Mk1 flight times inconvenient. Compass Mk2 schedules were somewhat more attractive, although flight frequencies were still less than those of the major airlines. In addition, the incumbent airlines had airline clubs established (Golden Wing and Flight Deck) and offered a wider network of routes.

Compass Mk1 appeared to operate on the presumption that the incumbent airlines would not be willing or able to match their discount prices, and that it could unilaterally offer discounts to improve cash flow, and then revert to higher prices. Compass Mk2 appeared to presume that a non-threatening price and entry strategy would induce the incumbents to soften their price competition. They couldn't. Both Ansett and Australian matched Compass discounts and, once offered, there are severe difficulties facing airlines wishing to ratchet discount prices upwards. The airline increasing price will face immediate penalties in terms of loss of market share and load factors and, in the longer term, will improve competitors' reputations as value-for-money airlines.

Eastwest and Ansett. Eastwest has undergone a number of changes in strategy under various owners and different regulatory environments in search of an ideal market niche. The company's most recent change in strategy was to play a complementary role to that of Ansett, positioning itself as Australia's number one holiday and leisure airline with one-class, value-for-money services and a simple discount fare structure. The search for a niche has not so far been entirely successful. Load factors have been relatively low, costs have been high and in 1992–93 the likelihood is that the company will make a loss for the fourth year in succession. Much of Eastwest's formerly independent operations have now been merged with Ansett.

Qantas and Australian. Qantas' takeover of Australian Airlines has allowed it to jump five places to number 15 in world airline rankings in terms of revenue. The most important expected effect of the takeover is the marketing advantage which it will confer on Qantas if it can provide a 'seamless' service and 'operational synergies' through improved flight frequencies, schedules and seat availability through access to a larger fleet. However, there is no evidence in the literature that Qantas can achieve any cost reductions from becoming a larger airline. This is because there are no clear economies from increasing the size of operation, and no gains achievable from economies of density, as the two airlines operated largely on different routes and the merged airline's traffic density would be approximately the weighted average of the two entities.

However, the merger may have had an indirect effect in providing an opportunity to target areas of low productivity. Qantas commissioned a review by Coopers & Lybrand to identify savings opportunities as a result of the merger. The review identified annual savings of $158 million — $95 million as

a result of staff reductions, and $63 million elsewhere.[1] This represents a saving of nearly three per cent on the combined costs of the two airlines in 1991–92 and therefore indicates significant scope for improvement in productivity and profitability. The Coopers & Lybrand review recommended a reduction in staff numbers of 1835. A reduction of around 1000 staff is expected to have been achieved by mid 1993, and while more reductions are expected to occur in later periods it is likely that the figure will be somewhat lower than 1835 before the staff rationalisation process is complete.

CONDUCT

Changes to domestic air fares

During the 1980s domestic air fares followed a pattern of stable growth loosely in line with domestic inflation. Also during this period the average fare paid for air travel remained close to 80 per cent of the average full economy fare. Both these trends have disappeared following deregulation.

In the last two years the average fare paid for air travel has fallen, reaching a low point during the December quarter 1991 when average fares were 34 per cent cheaper in real terms than they were just prior to deregulation. During 1992 average fares rose from this low point for the first half of the year and then remained relatively stable for the second half, ending the year higher than December 1991 prices but still 21 per cent cheaper in real terms than before deregulation.

However, travel has not been cheaper for all classes of passenger. The lower average fares have resulted from discounts becoming deeper and more available, and therefore the main beneficiaries of lower prices were those passengers able or prepared to fly on discount fares. The full economy fare can often be the cheapest fare available to business travellers, who either make their flight booking at the last minute when all discounts are sold out or are unavailable due to pre-purchase time constraints, or who wish to retain full re-ticketing flexibility which can often be unobtainable under discount fare conditions. Full economy fares and first and business class fares have all risen in real terms over the last two years.

The average price of full economy travel rose steadily over the first five quarters following deregulation and by the December quarter 1991 had undergone real growth of 14 per cent. Prices remained steady in real terms during 1992.

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1. Given one-time implementation costs of about $65 million, the net annualised savings were claimed to exceed $70 million by the end of 1993.

The real average price of both business and first class travel also rose following deregulation. By the December quarter 1991 the cost of both first class and business class travel had risen in real terms by 23 per cent. A short period of competition between Ansett and Australian in the second quarter of 1992 resulted in substantial reductions to fares, which saw average prices for both first and business classes drop to real levels slightly below pre-deregulation prices. By the end of 1992 both fare classes had risen again, with first class fares 6 per cent and business class fares 13 per cent more expensive than before deregulation.

Changes in service quality

In order to gauge the success of the government's aviation reform program it is important that all aspects of firm conduct are assessed. The concept of quality of service refers to the degree to which the needs and wants of consumers are satisfied by the service provided. The following aspects of service quality are considered to have the greatest impact on consumer welfare:

- safety;
- passenger accessibility to the regular public transport network;
- frequency of service;
- non-stop service;
- on-time performance;
- airport services and facilities; and
- on-board comfort and service.

These key aspects of service quality either improved or remained constant over the time period examined. Flight frequency on the 50 busiest routes serviced by the domestic airlines increased by a weighted average of 29 per cent between the September 1990 and 1991 quarters and by a further 9 per cent between the September 1991 and 1992 quarters. Consumers benefited from improvements in the on-time performance of regular public transport operators over the post-deregulation period to December 1992: an overall improvement in on-time performance was evident at each of the mainland State capital airports. The level of non-stop service provided by the domestic airlines improved: during 1991 and 1992 both the number of non-stop routes and the frequency of non-stop flights increased. The available evidence for the service quality aspects of safety, passenger accessibility to the regular public transport network, airport services and facilities, and on-board comfort and service support the conclusion that the quality of service in these areas remained relatively constant. None of the above is to say, however, that there cannot be further improvement. The Bureau is investigating whether better

information can be provided on airline and air space management efficiency, particularly with regard to on-time performance.

PERFORMANCE

Industry and airline performance

Performance measurement, besides being important to owners and managers, is important for evaluation of public policy towards the airline industry as well as an adjunct to further policy formation. A suite of performance measures is generally required as no single measure of industry performance is entirely satisfactory. In this report we examine growth rates, profitability, allocative efficiency, market and modal shares and propensities to travel.

Growth in Australian airline industry outputs has been mixed, with flat spots, such as in the early 1980s, and periods of strong growth, particularly for Qantas in the mid 1980s and for domestic airlines since domestic deregulation. Industry output, measured on a tonne-kilometre basis, shows Qantas as the dominant Australian airline because of its long-haul characteristics. When measured on a passenger numbers basis, Ansett dominates domestically by a small margin on account of its wider route network, but Ansett and Australian are virtually equal market leaders on the main trunk network.

The profitability of the airline business in Australia has long been finely balanced and profitability has generally been moderate. For the domestic airlines, a period of positive earnings growth in the mid 1980s was followed by losses brought on by the pilots' dispute and domestic deregulation. Domestic airline revenues have dropped in real terms by about 20 per cent since deregulation. Qantas' financial performance has been uneven. At times it has attained reasonable profitability, but since 1989 profits have been reduced by the domestic pilots' dispute followed by the Gulf War and international recession. There has been a reduction in Qantas' real yields since 1986 of nearly 20 per cent. A significant constraint on all the airlines' performances has been high debt burdens. Thus economic returns, as measured by earnings before interest and tax, have been significantly higher than balance sheet measures of returns on operations. Australian airline companies achieved middle- to upper-ranking rates of return on assets when compared with rates of return for the major world airlines in financial years 1989–90 and 1990–91. This compares with consistently good performances by near Asian neighbours, such as Malaysian, Thai, Singapore and Cathay Pacific. Some preliminary analysis indicated that Qantas was middle-ranking in its productivity relative to selected world airlines, with Singapore Airlines again an outstanding performer. This result was consistent with the outcome of the

Coopers & Lybrand review of Qantas mentioned earlier. If Australia is to be competitive in the airline business in the future, we will need to match the financial performance of these airlines in whose markets we will be competing.

Another aspect of airline industry performance is modal share. In the mid 1980s modal share of interstate overnight travel was fairly constant among air travel, buses, private vehicles, rail and ferry. The 1989–90 pilots' dispute saw airline modal share reduced because the industry couldn't deliver. In the subsequent recovery and domestic airline deregulation, the airline industry has gained modal share at the expense almost equally of all other modes. Airline industry modal share is now running at an all-time high of about 37 per cent of interstate overnight journeys.

Finally, it is of interest to know what effects aviation reform has had on propensity to travel. Overseas travel has increased in terms of the number of departures per head of population throughout the 1980s. For domestic airline travel, the number of air journeys undertaken per head of population per annum was increasing slowly through most of the 1980s. The pilots' dispute caused a big reduction in airline travel, and domestic deregulation was a big boost. The number has increased from under 30 in 1982 to 39 air journeys per 100 persons in 1992. It seems permissible to infer that there has been about a 30 per cent increase in the propensity to travel by air.

Welfare gains from domestic aviation reforms

The aviation reform measures introduced in recent years have produced a wide range of effects, many of which have been mentioned above, such as the realisation of gains to consumers from cheaper air fares. But what has been the total picture, the net impact on society of all these changes?

Within the partial equilibrium framework of the aviation industry, net gains in economic welfare of an estimated $100 million per year have so far been realised as a result of recent domestic aviation reforms.

This figure is based on quarterly estimates for the period March quarter 1991 to September quarter 1992 and is made up of:

- net increases in the consumer surplus of air passengers resulting from improved access to direct services, lower average air fares, and reduced schedule delay (the time between a traveller's ideal departure time and the closest available flight);
- a transfer from producers to consumers resulting from lower average air fares; and
- net gains to producers from labour and capital productivity improvements.

On average, transfers between producers and consumers as a result of changes to air fares have been one-way so far, with average fares for all seven post-deregulation quarters evaluated being lower in real terms than pre-deregulation prices. Net gains to producers from productivity improvements have been positive, as have gains from improvements in access to direct services.

However, the net gain in consumer surplus from changes to schedule delay over this period does hide some losses. In the September and December quarters of 1991, there were small losses of consumer surplus from net increases in schedule delay, being of the order of $1 million per quarter. The principal cause of these losses was the very high load factors achieved on many routes during these quarters, high load factors leading to an increase in schedule delay for many passengers.

Conclusions

There have been both winners and losers in the process of reform. The winners have been most airline passengers. In the domestic market there have been clear gains to consumers in almost all aspects of pricing and service quality. On the other hand, airlines have lost profits and their employees have less employment security. Given that there was no opportunity to volunteer for these changes it cannot be said that there has been an improvement in allocative efficiency in the strict sense of Pareto optimality. However, calculations of economic welfare show that the gains are clearly larger than the losses, to the extent of some $100 million per annum.

In addition to the ongoing benefits from reforms it is highly probable that there is scope for further improvements in industry performance. Productivity gains take longer and may be harder to achieve than increases in competition and corresponding benefits to consumers. We believe that some areas where there is scope for productivity improvements under current policy settings are in the following:

- Civil Aviation Authority productivity is likely to improve when the new airspace management and radar systems, AMATS and TAATS, are fully implemented, with flow-on gains for airlines.
- New investment projects such as Sydney's Kingsford-Smith Airport third runway will indirectly improve airline productivity through reducing traffic delays.
- The use of flight engineers will eventually be discontinued in all aircraft as current Boeing 767's and Airbus A300's are replaced.
- Deregulation of intrastate aviation in New South Wales, Queensland and Western Australia may bring about a productivity improvement in regional and commuter airlines.

- Qantas/Australian productivity is likely to improve following the implementation of a report by Coopers & Lybrand on the scope for productivity improvement following the merger of the two airlines.
- International airline productivity may improve if further competition is engendered by Australia's multiple designation and other policies announced in the *One Nation* statement.

All of this aviation reform takes a lot of digestion by the industry, and it is expected that the effects of the reforms undertaken so far will still be making themselves felt in the seven years to the turn of the century. Certainly, the aviation industry in the United States is still settling down after a much longer period of experience with market reform.

Nevertheless, the overall impression with Australian aviation reform is one of progress made. Greater freedom now exists in market entry, and for competition between incumbent domestic operators; travellers now face lower average air fares; domestic operators have improved their efficiency; and within the domestic market, annualised net welfare gains of around $100 million have been realised. There may still be a long haul before anyone is completely satisfied with the efficiency of our airline system or its contribution to Australia's competitiveness but, so far, we can judge that we are on target and on the right track.

PART I: STRUCTURE

CHAPTER 1 INTRODUCTION

RECENT REFORMS

The overriding aim of the whole micro-economic reform program of which aviation is a key plank has been to pursue regulatory outcomes that will bring the most substantial benefits to the economy and consumers, and encourage greater efficiency. It has been the aim of aviation reform to encourage the development of competitive and efficient carriers operating in the industry, and the generation of new traffic. In addition, by making these changes it was hoped to increase the net benefits which flow into the economy.

Federal Government reform of Australia's aviation industry in recent years has been wide-ranging and substantial. The Evans statement in 1987 announced and set the agenda for deregulation of interstate aviation to take place in 1990. The Willis statement in 1989 established a new basis for negotiating bilateral agreements aimed at maximising the benefits to Australia. The Collins statement of 1992, aimed at further enhancing competition and efficiency in the aviation industry, announced measures designed to remove a number of the barriers between domestic and international markets.

In addition to these major policy changes, the government has substantially reformed aviation government business enterprises in recent years. The Federal Airports Corporations and the Civil Aviation Authority both commenced operations in 1988 to undertake the provision of aviation infrastructure on a sound commercial basis, recovering their costs and providing a dividend to the government when possible. Qantas was permitted in 1992 to purchase 100 per cent of Australian Airlines for $400 million, and this new merged operator was made available for a 100 per cent sell-off. British Airways finalised the purchase of 25 per cent of Qantas in March this year.

PREVIOUS WORK

What then have been the outcomes of this wealth of change? This report constitutes an attempt to analyse the progress of these reforms and their effects on the industry and consumers. It follows on from and complements a series of reports which have been produced by the Bureau of Transport and Communications Economics examining at various stages the progress and outcomes of the reforms. Previous related publications include the following:

- *Domestic Aviation in Transition,* the proceedings of a seminar held in March 1989 to discuss the then current and recent operations of the Australian domestic aviation market. The seminar proceedings present a summary of the structure, conduct and performance of the airline industry during the period 1983 to 1989, covering such areas as market growth, ownership changes, fare trends, and financial results.
- *A New Era in Australian Aviation,* the proceedings of a conference held in May 1991 to discuss developments following the then recent domestic interstate deregulation. Material was presented by representatives of the airlines, government, consumer associations, and the travel industry on topics such as: the airlines' response to deregulation in terms of fares, cost-cutting, and service quality; the role of government after deregulation; the privatisation of government airlines; aviation safety; the provision of aviation infrastructure; and trends in international aviation.
- *Deregulation of Domestic Aviation — the First Year,* a report published in November 1991 analysing the extent to which government policy objectives regarding interstate deregulation were, by mid to late 1991, being met. The report focuses on developments in interstate aviation during the last few months of regulation and the first year of deregulation.
- *Quality of Service in Australian Passenger Aviation,* a report published in December 1992 which measures changes in the quality of service provided to airline passengers subsequent to the implementation of aviation reforms.

STRUCTURE OF THIS REPORT

The report is presented in three sections, this structure reflecting the industrial organisational paradigm of industrial *structure* influencing the *conduct* of firms which in turn shape market *performance*. This taxonomy is inevitably somewhat arbitrary as many aspects of airline behaviour can have both conduct and performance characteristics. Pricing, for example, can be an element of how airlines conduct themselves in the new competitive environment as well as being a performance benchmark for whether there have been any benefits from reform.

Part I — being on the structure of the industry — contains chapters on the following:

- *Development of government policy since 1987,* which describes the evolution of government policy towards aviation in response to the micro-economic reform agenda;
- *The airline industry,* which examines certain elements of airline industry structure in Australia such as ownership, scope of activities, the breakdown of costs, route densities and the size and composition of the labour force and aircraft fleets;
- *Airline economics and scope for entry,* which examines the supply and demand forces acting within the airline industry, and the scope for entry of new operators;
- *Industry structural developments,* which details some of the developments which have occurred in industry structure over the last two years, such as the demise of Compass Mk1 and Mk2, the amalgamation of Eastwest with Ansett and the takeover of Australian by Qantas.

Part II — being on the conduct of firms in the industry — contains chapters on the following:

- *Changes in domestic air fares,* which details post-deregulation changes in the suite of air fares available to domestic travellers, and investigates questions such as whether competition has had an effect in lowering prices;
- *Changes in service quality,* which discusses changes in the quality of service provided by the regular public transport passenger aviation industry in the post-reform period.

Part III — being on the performance of the market — contains chapters on the following:

- *Industry and airline performance,* which presents a number of simple measures of industry performance, from the viewpoint of both operators and the industry and the economy as a whole;
- *Welfare gains from domestic aviation reforms,* which examines the net changes in economic welfare that have come about within the domestic aviation market as a result of the recent aviation reforms, and illustrates how the individual components of welfare change such as increases in quality of service come together to form a total picture of the benefits of market reform;
- A general *Conclusions* chapter finishes this section of the report.

CHAPTER 2 DEVELOPMENT OF GOVERNMENT POLICY SINCE 1987

The aim of this chapter is to describe the evolution of government policy towards aviation in response to the micro-economic reform agenda.

In just over five years the nature of Australia's aviation industry has changed dramatically. For over 30 years the industry operated in an environment where change was the exception rather than the rule and in which the airlines were constrained by a high degree of government regulation of day-to-day operations. As our aviation industry reached maturity, however, the government recognised the need to allow market forces of supply and demand to determine prices and service quality within the industry.

DOMESTIC AVIATION

The history of domestic aviation in Australia has been dominated by a series of economic regulatory arrangements, collectively known as the 'two airlines policy'. These arrangements were initially introduced in an attempt to prevent a monopoly emerging in domestic aviation. Details of the two airlines policy were subject to a series of reviews between 1952 and 1985.

The Chifley government established the Australian National Airlines Commission in 1945 and it commenced operations in the domestic aviation market under the name of Trans-Australia Airlines (TAA) in 1946. The Government instituted a number of measures (for example, financial assistance for the airline and a monopoly of government business) in order to create a favourable environment for TAA and to give the government-owned airline an advantage over private operators (Department of Aviation 1986).

This situation, however, was not supported by the Menzies Government, elected in 1949. Part of its election platform was the commitment to create an environment in which TAA would have to operate competitively (Department of Aviation 1986). As a result, in 1952 the Menzies Government entered into an agreement with the largest of the private airlines, Australian National Airways (ANA), ensuring it security of tenure and a basis on which to plan its future

plan its future financial developments. At the time of this initial agreement, regulation of the aviation industry was considered necessary to foster the development and growth of an infant industry in an orderly manner by ensuring the long-term financial stability of the major domestic airlines (Evans 1987). The initial agreement was intended to be in force for only 15 years, but instead it provided the basis for the policy which dominated the domestic market for the next 40 years.

The two airlines policy encouraged the airlines to service unprofitable routes in rural Australia, through the provision of financial assistance. It also allowed the government to regulate airline capacity so that it closely matched airline demand, thus avoiding the provision of excess capacity and the associated higher costs. By regulating the industry through these agreements the government was trying to promote fair and workable competition between the airlines and discourage monopolisation (Evans 1987).

Over time, as the industry matured and the airlines developed into financially stable entities, the level of economic regulation of the industry gradually declined. By the 1970s there was an increasing level of dissatisfaction with the government's airline policy, and the 1972 Senate Report on the Proposed Takeover of Ansett Transport Industries Ltd by Thomas Nationwide Transport Ltd highlighted a number of perceived shortcomings of the two airlines policy.[1] It was against this background of general dissatisfaction that the reform process began.

Domestic aviation reform

By the mid 1980s, it had become apparent that the rationale on which the domestic aviation policy was based was no longer valid. It was also at this time that the Hawke Government was moving towards micro-economic reform throughout Australian industries. The growing popularity internationally of a more liberal approach to regulating the aviation industry and a greater belief that the market could correctly determine supply and demand without government intervention has had an influence on the micro-economic reform of aviation in Australia. The United States experience with deregulation and the apparent trend towards 'globalisation' of carriers have also had powerful effects on the mood for reform.

As with other aspects of the micro-economic reform agenda, the objective of economic deregulation of the aviation industry was to ensure that the price of the services provided reflected their true economic costs (Beazley 1991). In

1. In particular, the following areas were highlighted: parallel scheduling, rural air services, freight services, concession air fares, curfew infringements, cost recovery, and expansion of other air service operators.

addition, the introduction of competition to the domestic aviation market was expected to encourage the airlines to reduce their costs and become more responsive to the needs of consumers.

The first move towards reform occurred in March 1985, when the Independent Review of Economic Regulation of Domestic Aviation (the May Review) was established by Peter Morris, Minister for Aviation. The review committee reported back in 1986. Overall, the findings of this review were critical of the existing arrangements and drew attention to public dissatisfaction with the quality and price of airline services. Five options were presented for future change, ranging from maintaining the status quo, to full economic deregulation (May Review 1986).

The Hawke Government chose to support the most radical of the five options, withdrawal from economic regulation of the domestic aviation industry. This was the option preferred by the May Review and was supported by public comment. Such a decision meant that a new approach to areas such as the provision of infrastructure and services, safety regulation and the role of government aviation business undertakings was also necessary.

On 7 October 1987, Senator Gareth Evans, Minister for Transport and Communications, made a policy statement which established the ground rules for the deregulated domestic market. This announcement detailed the new role the government was to play in Australia's aviation industry.

One generally held expectation of deregulation was the introduction of greater competition both for and between the incumbents, Ansett and Australian Airlines. In order to ensure that new players were free to enter the market, the constraints to entry on trunk routes were removed. It was the controls over the importation of aircraft, however, that had underpinned the legislative and contractual arrangements regulating the industry (Evans 1987). Following the removal of these constraints and the withdrawal by the government from the detailed determination of the amount of passenger capacity that may be provided by the trunk airlines, the paths were cleared for new entrants to operate in the deregulated market.

Three years notice had to be given before the two airlines policy was officially ended, so the government introduced a number of smaller changes to increase competition in the domestic market before deregulation became official in 1990. The restriction which had prevented domestic operators other than Ansett and Australian from operating commercial domestic charter flights with large jet aircraft was lifted and, as of 1 July 1988, Qantas' rights to carry the passengers of other international airlines on the domestic sectors of its

services were restored.[2] These changes were not intended to undermine the scheduled passenger services provided by the two major players; rather they were a small contribution towards stimulating competition before deregulation 'proper' could be introduced.

Removing the barriers which had previously restricted Australia's domestic aviation market to a two airline industry was not the end of the story. One of the expectations of deregulation was the introduction of a wider range of air fares than was previously available. The Evans statement announced the abolition of the Independent Air Fares Committee (IAFC), which had been set up in 1981 as the sole Commonwealth authority with the responsibility for determining and approving domestic air fares.

Although the IAFC was disbanded, the government had not abdicated its responsibility for consumer protection. The Trade Practices Act was to apply to the new aviation industry environment, enabling the government to maintain a limited degree of prices surveillance and to ensure that new entrants would be provided with effective access to the industry. Economic deregulation of domestic aviation was also to be independent from safety regulation of the industry. The government did not withdraw from, or lessen the effectiveness of, safety regulation (Evans 1987).

Economic deregulation was not equivalent to an 'open skies' policy. Access to the domestic market for Qantas was limited to the interlining rights which had been restored to Qantas, and foreign airlines, particularly those operating international services to Australia, were not granted access to the market (Evans 1987). The possibility of extending the Closer Economic Relations Agreement between Australia and New Zealand to aviation was also rejected in 1987.

In the Evans statement it was argued that if international carriers were allowed to compete directly with the domestic airlines, the domestic airlines would be entitled to demand full international rights in return (Evans 1987). As the government wished to keep the industry as stable as possible while deregulation was introduced, to allow the full benefits of deregulation to be realised, the decision was made to exclude international carriers from competing in the domestic market.

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2. New guidelines for international freight and passenger charter services were also announced in the Evans statement. This increased the range of commercial opportunities open to domestic operators and gave the domestic carriers an opportunity to play an important supplementary role in the promotion and development of Australian exports.

INTERNATIONAL AVIATION

A relatively stable approach to the economic regulation of international aviation was maintained by successive Australian governments until 1987. The general recognition of the importance of air transport to Australia because of its geographic location was reflected in the support given to scheduled international air services by these governments. The policy towards international aviation was directed towards ensuring that international services were provided at fares which were both consistent with public interests and the commercial viability of the operator providing the service (Department of Transport 1978).

Due to the structure of the global international aviation industry, which was dominated by a series of bilateral agreements between countries, the economic regulation of international aviation in Australia was influenced by the attitudes of those countries with which Australia had negotiated Air Service Agreements (ASAs). Unlike in the domestic market, the Australian Government was not in the position to totally regulate (or deregulate) the provision of international services unilaterally.

The decision by successive Australian governments to designate only one Australian airline, the then wholly government-owned company Qantas Airways Ltd, to operate international services has been a major element of Australia's international aviation policy. In order to provide Qantas with a favourable operating environment, the interests of Australia's flag carrier were the predominant factor in the decision of whether or not to enter into a new ASA with a foreign government or to amend existing ASAs (Willis 1989). As a result of this approach, international rights were negotiated on a quid pro quo basis.

This decision to safeguard Qantas' interests was largely based on the composition of Australia's international aviation market, the majority of which was derived from carrying Australians into and out of the country. It was argued at the time that if foreign carriers were allowed to saturate the major routes with capacity, there would have been little incentive for those airlines, unlike Qantas, to develop and promote tourism to Australia (Willis 1989).

In addition it was important to develop and retain a strong, competitive Australian 'flag carrier' presence in international aviation. There was a widely held belief that, without the presence of a strong Australian carrier in the market, air service arrangements would not have operated to the advantage of Australia's national interests (Department of Transport 1978). Qantas already faced competition from other international airlines, and there was nothing to be achieved by introducing additional competition from other designated Australian carriers given the relatively small traffic base in Australia (Evans 1987).

International aviation reform

The Evans statement in 1987 was primarily concerned with the government's approach to domestic deregulation, and the implications that such a dramatic change in policy would have. The possibility of changing the extent to which international airlines, and in particular Qantas, were permitted to compete in the domestic market had been considered previously, but it was decided not to increase competition via the removal of the barriers between international and domestic operations.

As mentioned above, the decision to limit Qantas' and other international airlines' access to the domestic market was influenced by the prospect of domestic operators demanding the reciprocal right of being allowed to operate as designated international Australian carriers (Evans 1987). In order to maintain some kind of control over the whole process of change in the market, the unlimited introduction of international operators in the domestic markets, and its repercussions, was not considered appropriate at the time. As a result, Qantas' interests continued to be a key determinant when negotiating for new Air Service Agreements, or amending existing ones. The government also continued with its policy of designating only one Australian airline to take up Australia's rights to operate scheduled international services.

A major change in the government's policy towards international aviation policy was announced on 15 June 1989. Ralph Willis, Minister for Transport and Communications, made a statement regarding the new approach that the government was to adopt when negotiating for international rights. Consistent with its approach to domestic aviation, the government decided to change the emphasis of its policy, from protecting the rights of the airline to maximising the welfare of the users and of Australia as a whole (Willis 1989).

The change to international aviation policy was partly the result of major changes which were taking place worldwide in international aviation, making competition extremely tough in the market (for example, the predominance of 'mega-carriers' and the move towards marketing agreements between global carriers). Perhaps a more significant factor in prompting the review by the government was the surge in inbound tourism which occurred in the mid 1980s, and accelerated in response to Bicentennial celebrations and Expo. This prompted the government to send a reference to the Industries Assistance Commission on the factors impeding the competitiveness and efficiency of the travel and tourism industries (IAC 1989), and the Commission released its findings early in 1989. It concluded that it was in Australia's best interests for the government to adopt a more open approach when negotiating ASAs (IAC 1989).

Following this upsurge of inbound tourism in the mid 1980s, it became apparent that Australia could be recognised as a major tourist and business destination in its own right. The composition of Australia's international

aviation market was no longer heavily biased towards the carriage of Australians into and out of the country.

The Willis statement highlighted the potential for maximising national benefits from trade in international aviation services. Qantas' role as a major contributor to the balance of payments and a major promoter of Australian tourism was not forgotten, but a wider range of views (such as tourism and trade, as well as Qantas) was to be considered during the negotiation process. It was expected that by following this approach, earnings from inbound tourism could be increased without affecting Qantas' ability to compete in the expanding international market.

The aim of the negotiation was still to win rights for Qantas to serve a wider range of destinations and to build a more sophisticated network of services, but new services by foreign carriers, if the services would increase tourism and trade, were also to be encouraged. Growth and competition were to be promoted through the development of arrangements with other countries, and airlines were to be given greater commercial freedom to introduce new services and respond more quickly to market demand.

Other initiatives included the decision to examine the benefits of a separate Australian international carrier to operate scheduled cargo services, and the movement towards encouraging foreign carriers to serve the full range of Australian gateways. As a result of these policy changes, a strictly reciprocal exchange of international aviation rights no longer applied to the negotiation process (Willis 1989).

TOWARDS THE 21ST CENTURY

The distinction between international and domestic aviation was becoming blurred by as early as 1987, when Senator Evans announced that Qantas' interlining rights were to be renewed. While introducing major changes to the regulatory policy of domestic aviation, however, the government had endeavoured to keep in place some barrier separating the markets. This was achieved by restricting Qantas and other international carriers from operating scheduled services in the domestic market and continuing to designate only one Australian airline to take up Australia's rights to operate scheduled international services.

Less than two years after domestic deregulation had been introduced officially and three years since the government reviewed its approach to negotiating international aviation rights, Senator Bob Collins, Minister for Transport and Communications, announced the next stage in the evolution of aviation policy. This statement dealt with many of the questions that had been raised in the earlier statements but had been put aside while the impacts of domestic deregulation were still being absorbed.

The policy developments outlined in Senator Collins' statement of February 1992, *Australian Aviation Towards the 21st Century*, were, like the previous policy changes, aimed at the promotion of national interests and enhancing competition and efficiency in the industry.

Many of the major initiatives announced in the Collins' statement were related to removing some of the barriers between the domestic and international markets. As with the other announcements in the statement, this decision was in part a response to how the domestic market had reacted to deregulation. In order to increase competition in the domestic market, the decision was made to allow Qantas to compete domestically, initially by selling spare capacity on the domestic sectors of its international routes. Qantas commenced its domestic operations on 1 November 1992.

Closely linked to this initiative was the decision to provide domestic operators with an opportunity to operate internationally, which had been discussed at length since 1987. It was announced in 1992 that the government would now allow other Australian carriers to compete with Qantas for capacity entitlements on international routes. To achieve this, the bilateral ASAs were to be renegotiated with a view to securing multiple designation agreements with other countries, using a pro-competitive approach directed at achieving enhanced route and capacity agreements (Collins 1992a).

The possibility of a conflict of interest occurring when allocating international capacity and having to choose between the then government-owned flag carrier and a private airline led to the establishment of the International Air Services Commission (IASC), thus keeping decisions at an arm's length from the government. The functions of the IASC include decision making in terms of allocating capacity and renewal of allocations, reviewing these decisions and providing advice to the Minister on matters related to international air operations (IASC 1992). Since the IASC commenced operations on 1 July 1992, it has granted Ansett Airlines capacity on a number of international routes, including Australia to Singapore.[3]

Although in 1987 the government decided against extending the Closer Economic Relations Agreement between Australia and New Zealand to aviation, in December 1989 the Australian and New Zealand Governments jointly commissioned a study assessing the costs and benefits of a single Australasian aviation market. The study concluded that there were significant welfare gains to be made from creating a single aviation market (BTCE & New Zealand Ministry of Transport 1991). It was announced in the Collins statement that the Australian Government was to seek the New Zealand

3. 'Ansett gets Asia routes', *Financial Review*, 8 March 1993, p.6.

Government's agreement to implement a single aviation market for the two countries.

In addition to an initial agreement to multiple designation on the trans-Tasman route, the negotiations involved seeking the agreement of the New Zealand Government to participate in a multiple designation regime for Australian and New Zealand carriers in the international market. It was planned to initially adopt, through negotiation, mutually beneficial approaches involving the exchange of interlining rights, but not cabotage (Collins 1992a). By November 1994 at the latest, however, Air New Zealand was expected to have access to domestic routes in Australia (Storey 1992; Collins 1992b).

On 3 June 1992, less than four months after the Collins statement was made, the two governments had reached an agreement on some of the major changes to the Australia – New Zealand aviation relationship. In addition to the above, the agreement will also facilitate an expansion of beyond-rights for both Australian and New Zealand carriers. A Memorandum of Understanding was signed by the two governments on 1 August 1992.

REFORM OF GOVERNMENT BUSINESS ENTERPRISES

Reform of government business enterprises (GBEs) was a major part of the government micro-economic reform process. In 1991, the government had over 20 business enterprises, with four of the largest being directly involved in the aviation industry.[4]

The objectives of the reform process included enabling the GBEs to perform more effectively and efficiently on a commercial basis, in an increasingly competitive environment. A second objective was to encourage the GBEs to become more financially viable in order to reduce their demands on the budget, as well as to ensure that they had a secure financial basis from which to expand and diversify their operations. As a result of these reforms the government intended to ensure that GBEs provided substantial and growing benefits to the community while being responsive to industry needs.

Federal Airports Corporation

In August 1985, Peter Morris, Minister for Aviation, announced the intention to establish the Federal Airports Corporation (FAC) which would be responsible for the provision of basic airport facilities, planning airport layouts and leasing facilities to airlines. The FAC commenced operations in January 1988.

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4. Australian Airlines, the Civil Aviation Authority, the Federal Airports Corporation, and Qantas.

The establishment of the FAC was consistent with the guidelines established by the Senate Committee on Finance and Government Operations, as this committee concluded that if the government wished to be involved in business activities, the most suitable way is in the form of a statutory authority (DTC). At the time it was felt that normal departmental procedures and controls were not suitable to the commercial activities that were involved in running an airport. In particular, Morris highlighted that under government management, the priorities for the development of aviation infrastructure were being influenced by concerns unrelated to economics or efficiency (Morris 1985).

Although the FAC was established in an attempt to improve the efficiency with which Australian airports were operated, there were really three major objectives. The FAC was given the responsibility of providing convenient facilities for air operations and ensuring that these facilities fitted in with community needs. The FAC was also expected to place the airports under its control on a sound commercial basis. Finally, the FAC was expected to develop and manage airports to meet the present and future needs of airport users in a safe, efficient, effective and economic manner (DTC).

As at 1 April 1993, FAC operated 22 airports throughout Australia, including the major airports in all the capital cities. Under its charter, the FAC is responsible for the operation of these airports, the provision of terminal facilities and for other commercial activities carried out at the airports. It also may provide consultancy and management services to persons who operate (or propose to operate) airports. In addition, on 1 July 1991 the government passed responsibility for all airport security matters to the FAC (FAC 1992).

The activities of the FAC can be divided into two major categories — aeronautical and non-aeronautical — with revenue earned from both. Aeronautical charges include levies on the landing and parking of aircraft, the movement of passengers onto and off the plane, and the handling of cargo. Revenue collected from non-aeronautical activities is in the form of a contract, a lease or a license. These activities include leasing land to airlines for terminal gates and maintenance facilities, and leasing common user space for trading and retail outlets. The FAC also earns revenue through leasing land to a variety of non-aviation-related businesses (for example car parks, hotels and offices).

There has been some debate within the industry about the peak-period surcharge introduced by the FAC at Kingsford-Smith Airport on 1 April 1990. The charge was in the form of a minimum landing charge during the two peak demand periods 7.30 a.m. to 10.00 am and 4.30 p.m. to 7.00 pm, and initially applied only to general aviation aircraft. The charge was modified on 1 January 1991 when the FAC reduced the length of the peak periods, introduced shoulder periods and made regular passenger transport services liable for the charge during the peak periods.

As a result of the surcharge, landing charges during the peak hours became significantly higher than the average charge, and off-peak charges were significantly less, and this was expected to result in the more price sensitive operators choosing to use either off-peak slots or a different airport, thus reducing congestion at Kingsford-Smith during the peak periods. General aviation operators using Kingsford-Smith have protested against this charge, mainly because they believe it ignores the existence of a priority system which places general aviation aircraft at the bottom end of the system. General aviation operators argue that as a result of this system their aircraft can only gain access to Kingsford-Smith when no larger aircraft would be using the runways and so they should not be charged for contributing to the congestion.

There have been complaints about the high level of a number of FAC charges, particularly from the general aviation industry. However, the FAC has pointed out that, since its establishment, increases in landing charges have been in line with general cost increases, and there was a freeze on landing charges in the 1991–92 financial year (FAC 1992). The Industry Commission's report on intrastate aviation (1992) recommended a number of changes to the FAC's charging practices as well as an inquiry by an independent body into the peak and shoulder period surcharge at Kingsford-Smith Airport. In response to these complaints and the Industry Commission's recommendations, the Prices Surveillance Authority gave notice of an inquiry into the FAC's aeronautical and non-aeronautical charges, with initial hearings held in early February 1993.

As part of the government business enterprise reform program, the FAC is expected to recover costs from the industry including a reasonable return on its assets, which was set at a real rate of return of 7.5 per cent per annum based on earnings before interest. At the time this target was set the FAC was not liable for income tax, but as from 1 July 1991 the FAC has been liable to pay Commonwealth sales and income tax and State payroll tax. As a result the target is assumed now to be a real rate of return of 7.5 per cent before tax and interest. In regard to its tax payments, the FAC argued in its annual report that it had been unable to obtain deductions for depreciation on various aviation infrastructure assets, resulting in an effective tax rate of 71 per cent as opposed to the company tax rate of 39 per cent (FAC 1992).

Despite this, in the 1991–92 financial year, the FAC made an operating profit of $89 million before tax, with 40 per cent of its revenue coming from aeronautical charges.

The collapse of Compass Mk1 at the end of 1991 raised concerns about the suitability of terminal access arrangements for new entrants in a deregulated market. The Trade Practices Commission's report on the failure of Compass concluded that existing terminal lease arrangements confer a market advantage on the established airlines relative to new entrants. In view of the likely impact on competition of the current arrangements, the Trade Practices

Commission suggested that urgent consideration be given to the feasibility of the construction of a limited supply of common user terminal facilities to alleviate the problem.

The government's support for the development of common user terminals was outlined in the *One Nation* statement announced on 26 February 1992. This support stemmed from a need to provide further scope for competition and contestability in the deregulated domestic aviation industry. A major consideration in the deregulated aviation industry is the ability of new entrants to establish and expand a network.

After a detailed assessment of options for common user facilities, taking into account the changes resulting from the aviation reforms, the government announced on 7 February 1993 its intention to provide an equity injection of approximately $100 million to the FAC to cover the cost of developing common user terminal facilities at Sydney, Melbourne and Coolangatta airports.

Civil Aviation Authority

An in-principle decision to establish the Civil Aviation Authority (CAA) was made in 1986, following the announcement in September by the Prime Minister, Bob Hawke, about the reforms of the public sector. Further details of the role of the CAA were included in the Evans statement in 1987. The CAA was to be responsible for both safety standard setting and general regulatory control of the industry. It was felt that both of these areas needed to be under the control of a single authority, so that all elements could be coordinated to create a system which maximised reliability and effectiveness within the industry (Evans 1987), and that the CAA would be better placed to respond quickly and flexibly to the changing needs of the aviation industry (DTC).

The CAA commenced operations in 1988, taking over the regulation of day-to-day aviation operations, which had previously been the responsibility of the Department of Transport. The principal activities of the CAA are the provision of airspace management, air traffic control, traffic and flight information, navigation services, aeronautical information, safety and regulatory services, and rescue and fire fighting services.

In the 1991–92 financial year, the CAA made an after tax profit of $3.355 million, after income tax expenses of over $21 million. This allowed the CAA to return a dividend of $2 million to the government.

Despite the expectation that the CAA will operate profitably, it has managed to reduce charges to the industry in real terms in each year since it was established in 1988. In April 1992 the CAA announced that airway charges would be reduced by a further $96 million in the 1992–93 financial year. To achieve this the CAA reduced its costs, largely through a reduction in staffing numbers. There were over 7300 staff employed by the CAA in January 1991

but by the end of 1992 numbers had been reduced to 5757 and staffing is to be further reduced to 3819 by 1996 (CAA 1992).

According to its annual report, the CAA's primary responsibility is the safety of both aviation in Australia and Australian aircraft operating overseas (CAA 1992). In the past, this was not considered to be a commercial activity and the government provided the CAA with finance for safety regulation. In the August 1990 Budget, however, it was announced that from November 1991 the Commonwealth's annual financing of safety regulation[4] was to be phased out and funding was to be recovered from the industry. It was anticipated that by the 1994–95 financial year, only the CAA's search and rescue activities would be funded by the government.

The introduction of cost recovery, however, was subsequently delayed and a civil aviation safety levy was to be introduced to the industry from 1 July 1992. Following a decision in May 1992 to review the decision to recover the costs of regulating safety from the industry, the government announced in the August 1992 that it would provide ongoing funding for 50 per cent of safety costs up to a limit of $22.8 million a year. Recovery of the balance of costs is to be phased in over two years commencing in June 1993.

One of the major projects the CAA is currently undertaking involves the implementation of a modernisation strategy for the provision of air traffic and navigation services. The new system, known as The Australian Advanced Air Traffic System (TAAATS), was intended to be introduced by 1995 and was expected to reduce the costs of providing air traffic services through to the year 2010. The first stage of the new system involved the implementation of the Airspace Management and Air Traffic Services program (AMATS) which was based on standards set by the International Civil Aviation Organisation. AMATS involved a reorganisation of airspace categorisation, resectorisation, air traffic services procedures, staffing, structures and facilities (CAA 1992).

The tendering process for the contract to develop TAAATS was concluded in March 1992, and the CAA awarded the contract to French-based Thomson Radar (Australia) Corporation. The CAA's handling of TAAATS contractor selection, however, was subject to an independent review chaired by Ian Macphee. As a result of the review's findings, the decision to award the contract to Thomson was overruled. Both Thomson and Hughes Aircraft (a Canadian-based contractor ranked second in the evaluation process) have been invited to resubmit details of their proposals.

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4. In the financial year ending 30 June 1992, the CAA received $78.3 million from the government to fund the provision of safety services.

BUREAU OF AIR SAFETY INVESTIGATION

The Bureau of Air Safety Investigation (BASI) has the prime responsibility for the investigation of all safety related occurrences affecting civil aviation in Australia. BASI plays an important role in the domestic aviation industry monitoring the operational standards and safety practices developed by the CAA.

In order to establish the role of BASI following deregulation, an independent review of the agency was commissioned in 1989. As a result of this review BASI developed from an organisation which investigated all aircraft accidents in Australia, to one which focused on in-depth investigations of selected occurrences most likely to benefit aviation safety. BASI also took on an expanded role following deregulation, in that it now provides the Minister with policy advice in areas of its operational expertise (DTC 1991).

Following the establishment of the CAA in 1988, a deliberate decision was made to keep BASI separate from the CAA. The logic behind BASI remaining part of the Department of Transport and Communications was based on the belief that people within the aviation industry might be hesitant to report safety incidents to an agency which is part of the authority responsible for enforcing regulations. By keeping BASI separate from the CAA, it also meant that there was an independent body able to judge the CAA in terms of how it is improving and enforcing safety standards (Evans 1987).

THE CARRIERS

In keeping with the government's decision to withdraw from the economic regulation of domestic aviation in Australia, on 24 September 1990 the government proposed to a special national conference of the Australian Labor Party that Labor's policy be changed to allow for 100 per cent privatisation of Australian Airlines and 49 per cent privatisation of Qantas. Although this decision had a significant impact on the ownership structure of the airlines, it is important to note that in the years leading up to the decision to deregulate the domestic market, the government had distanced itself from the day-to-day running of the airlines.

There were a number of factors influencing these proposals. To begin with, the government believed that this approach would provide the airlines with more commercial freedom to compete successfully in the deregulated market. There was also the need to inject more capital into the two airlines, in order to reduce their debt-to-equity ratios to competitive levels. The government had to decide whether it was viable to invest sums of money in the airlines that were more than the airlines had ever paid the government by way of dividends in the whole of their existence (Willis 1992).

Following the decision to fully privatise Australian Airlines and partially privatise Qantas, a study was undertaken to assess the assets that were for sale, ways to enhance these assets, the various sales options and the appropriate timing and sequence of the sale. The study was concluded in April 1991 and the conclusions were put to Cabinet, whereupon it was decided to hold initial trade sales followed by public floats to sell remaining equity. Other decisions which would affect the outcome of the sales included: not allowing Qantas to bid for Australian Airlines and vice versa; Qantas remaining the only designated Australian international carrier; and Qantas not being allowed access to the domestic market except through interlining rights.

There was some discussion as to whether it may have been more appropriate to go straight to a public float. The government argued, however, that the initial trade sales would enhance sales proceedings by capturing a premium from investors who wished to acquire a significant equity interest in the airline. Another potential bonus in using this approach was the possibility of achieving an alliance with another international airline, thus ensuring a long-term future for Qantas in an industry where there is a movement towards mega-carriers.

The first public step in the sales process was in June 1991, when sales promotion documents were distributed to prospective buyers. The sales process, however, was hampered by a slow economy and the lack of stability in the industry. The review of the regulatory regime for international aviation announced by Senator Bob Collins, Minister for Transport and Communications, in his February statement (Collins 1992a) further increased the uncertainty about the environment in which the carriers would be operating following the sales process.

A number of the bidders and the airlines themselves felt that there were substantial gains to be achieved if Qantas and Australian Airlines were to be combined. In response to this, on 2 June 1992 the government announced that Qantas would buy Australian Airlines for $400 million. The government's earlier decision to sell only 49 per cent of Qantas was also reviewed at this time and it was decided that under the new conditions the outcome of such a decision would be unsatisfactory. As a result, the government decided to sell 100 per cent of the new carrier (Willis 1992). In March 1993, British Airways purchased 25 per cent of the airline for $665 million.

In addition to the foreign investment guidelines which apply to the sale of Qantas and are described below, the government has insisted that following the sale the trading name Qantas be retained for international air transport passenger services provided by the company, and that the head office and main operational base remain in Australia.

FOREIGN INVESTMENT GUIDELINES

The decision to deregulate domestic aviation created the need to review the guidelines for foreign investment in the industry. In the deregulated environment, continuing the special category for aviation under the Foreign Investment Review Board Guidelines was no longer consistent with the government's objective of opening up the industry to competition. Foreign capital could be a major contributor in realising the aim of increased competition, so the special category status was dropped and foreign investment into the domestic market became subject only to the general Foreign Investment Review Board Guidelines. The one exception to these new standards was related to investment by foreign international airlines operating services to Australia, in which case investment was limited to less than 15 per cent in any one domestic operator.

On 24 September 1990 the government announced its proposal to fully privatise Australian, and sell 50 per cent of Qantas, in order to allow the carriers to compete effectively in the deregulated market. Investors' uncertainty about the industry and the restrictions on investment by Australian and foreign operators contributed to the government's decision to review both the sales process itself and any government policy which might influence the outcome of this process. In particular, the limits on foreign investment were again reviewed and the government's new guidelines, which were intended to increase the size of the pool of potential investors' funds, were announced in February 1992.

The aviation-specific restrictions on equity investment between Australian operators were removed, and the foreign investment guidelines were also relaxed subject to the general guideline of ensuring that the investment was not judged to be contrary to national interests. Following the changes, foreign airlines flying to Australia could acquire up to 25 per cent of equity in a domestic carrier individually, or up to 40 per cent in aggregate. Equity in excess of these guidelines might also be considered by the government under special circumstances.

Foreign investors other than airlines flying to Australia are now entitled to purchase up to 100 per cent of a domestic carrier, or start their own, so long as it is not judged contrary to national interests. In terms of the purchase of Qantas, the aggregate equity investment limit for overseas investors was set at 35 per cent. A Cabinet decision made in November 1992 limited the level of the Qantas – Australian Airlines Group that any single foreign shareholder was allowed to control to 25 per cent.

AERODROME LOCAL OWNERSHIP PLAN

After the second World War, the Commonwealth adopted a policy of owning and operating all Australian aerodromes that had regular public transport air services. The rapid growth in air transport in the immediate post-war period and the consequent demand for new aerodrome facilities led to several modifications to the Commonwealth's approach to local aerodrome ownership through the 1950s. Initially the Commonwealth moved from the position of constructing aerodromes to one of acquiring aerodromes from local communities. Subsequently the Commonwealth ceased acquiring aerodromes, and this led to the development in 1958 of the Commonwealth's Aerodrome Local Ownership Plan (ALOP).

The ALOP was originally intended to encourage the transfer of aerodromes from Commonwealth Government to local ownership. The principle behind this plan was the belief that airports serving local needs are best owned and operated by their own community (DTC *Annual Report 1989–90).* Under the ALOP, the government provided technical advice and financial assistance to eligible aerodromes, with financial assistance in the form of a 50 per cent funding of the cost of approved maintenance work (DTC *Annual Report 1989–90).*

A review of the ALOP was completed in 1988, following which no new aerodromes were accepted into the plan while the findings of the review were considered by the government. On 21 August 1990, Bob Collins, Minister for Shipping and Aviation Support, announced the government's intention to invite all ALOP aerodrome owners to take full responsibility for operating their aerodrome. As part of this policy, those aerodromes still owned by the government were to be transferred to local ownership (Collins 1990a).

Following an aerodrome's move to full local ownership, Federal Government charges were no longer to be collected. As a result, aerodrome owners could develop their own charging strategy in an attempt to maximise the commercial potential of their aerodromes to the benefit of the community they serve (DTC *Annual Report 1990–91*).

In order to encourage the withdrawal of aerodromes from the ALOP or the transfer from Commonwealth to local ownership, a social benefit subsidy for aerodromes was to be considered. The subsidy, in the form of a one-off capitalised grant, was to be provided to those aerodromes which were not commercially viable, but were necessary if the social access and equity needs of a small or remote community were to be met.

According to the original policy statement in 1990, the program of transfers and withdrawals was to be completed by 1994–95. In February 1992, however, as part of his *Australian Aviation: Towards the 21st Century* statement, Bob Collins announced that an additional $27.5 million had been

allocated to the program, in order to accelerate the transfer of Commonwealth aerodromes and the withdrawal of locally owned airports from the ALOP. With the additional funding, the process was expected to be completed by 1992–93. The aim of fast-tracking this project was to encourage the development of a cost-effective regional aviation market (Collins 1992a).

As at 20 April 1993, 224 of the original 234 aerodromes had been withdrawn from the ALOP since the announcement of the government's new policy in 1990. Agreement had been reached for the withdrawal of an additional four aerodromes and notice that grants will cease had been given for another four. This left only two aerodromes for which arrangements had not been finalised.

FREIGHT POLICY

Until 1981, the provision of domestic freight services was regulated by the two airlines policy. The restrictions placed on the importation of aircraft under the Customs (Prohibited Imports) Regulation meant that TAA and Ansett dominated both the passenger and freight market. These airlines placed a greater emphasis on the provision of passenger services and as a result cargo services were heavily dependent on passenger aircraft. By the early 1970s, concerns had been voiced by users that there was a general lack of interest by the carriers in providing adequate freight services. Those services available were often subject to delay and the cost of express freight services were thought to be unnecessarily high (Department of Aviation 1986).

These concerns were considered in the Domestic Air Transport Policy Review (Department of Transport 1979) and it was recommended that air freight be excluded from the two airlines policy. When the Airlines Agreement was renegotiated in 1981, freight was removed from the ambit of the policy and measures were taken to ensure that other operators would be able to enter the market.

Since 1985 the Australian Government has progressively liberalised international freight services. Most air freight capacity is available on scheduled passenger aircraft (bellyhold cargo), scheduled pure freighters, and non-scheduled freight charter aircraft. Under most air service agreements, airline capacity is convertible to freight use in one form or another.

In 1987 the government removed restrictions on the operation of international freight charter flights and allowed the carriage of any type of cargo in any mix. Since this reform was undertaken, several hundred charter flights have operated in and out of Australia, meeting seasonal and niche market demands.

Qantas is the major Australian international scheduled freight carrier. Following the reforms announced in February 1992 by Bob Collins,

opportunities now exist for Australian carriers other than Qantas to operate internationally as dedicated freight operators.

OUTCOMES OF MICRO-ECONOMIC REFORM

As was discussed in chapter 1, the micro-economic reform program has pursued regulatory outcomes that will bring the most substantial benefits to the economy and consumers, and to encourage greater efficiency. As has been outlined above, reform of the domestic aviation industry has involved the government's withdrawal from the day-to-day regulation of the industry while maintaining some general controls (such as the foreign investment guidelines).

Through the reforms of the aviation industry the government has encouraged the development of more efficient carriers and has provided the opportunity for increased competition within the industry.

Following on from this examination of the way regulation of the domestic aviation industry has evolved, the next chapter describes the industry and the way in which the carriers operate within it.

CHAPTER 3 THE INDUSTRY

This chapter examines certain elements of airline industry structure in Australia: ownership, scope of activities, the breakdown of costs, route densities and the size and composition of the labour force and aircraft fleets. These are all factors which have the potential to influence industry conduct and performance either directly, through their effects on the intensity of competition among the existing airlines, or indirectly, through the size of the window of opportunity for new entrants to contest the market and bring about improvements in airline industry efficiency.

INDUSTRY OWNERSHIP AND SCOPE OF ACTIVITIES

Australia's two major domestic airline groups, Ansett and Australian, provide comprehensive network coverage on the major domestic routes. So far, Australia has one international carrier, Qantas. Ansett is now 'designated' for some international routes and other carriers, including Ansett, are gearing up to contest the international market. Air New Zealand has announced its desire to provide domestic services in Australia and will be permitted to do so by the end of 1994. While in terms of the number of market participants it appears that there has been no change in industry structure, it can be argued that the situation has indeed changed radically since 1987. The difference lies in freedom of entry and exit from the market and in the greater freedoms which now exist for established airlines to compete against each other. There is not complete freedom — certain intrastate airline markets are still regulated, foreign airlines with the exception of Air New Zealand are not permitted to provide domestic scheduled services in Australia, and international airline freedoms are constrained by the bilateral process of negotiating market access — but the regulatory changes which have occurred have radical implications for industry conduct and performance as will be seen in the second part of this report.

Qantas is in the process of privatisation, with a 25 per cent stake held by British Airways. Australian is now owned by and in the process of integration with Qantas and Ansett is owned jointly by TNT Ltd and News Corporation.

Both Qantas and the Ansett Group are much more than mere airline companies. They each have significant interests in travel agencies and tour packaging, resorts and hotels, express air freight and computer services. Ansett is the most diversified, with approximately 40 per cent of its revenues being derived from sources other than airlines and, in addition, it has airline interests in New Zealand and the United States as well as Australia. In addition Ansett has interests in aircraft leasing, removals, credit cards and diverse manufacturing and trading. The ownership structures and diversity of operations of Qantas and TNT/News airlines companies as at 30 June 1992 are outlined in figures 3.1 and 3.2. (Subsequent to this date, the ownership structure of Travel Industries Automated Systems Pty Ltd changed, with Qantas, Australian, Ansett and Air New Zealand now all having equal shares. TIAS owns and controls all the major Australian computer reservation systems.[1]) While some of the interests of the Ansett group have little relevance for airline industry conduct and performance, the interests which both groups hold in inputs to airline services, such as travel agencies and computer reservation systems, in a horizontal spread of airlines, (regional, domestic and international), and in tourism-related businesses (hotels, resorts and tour packaging) are relevant to their ability to compete through providing what the customer wants and through enhancing their potential market powers. This is an issue which will be addressed in more detail in chapter 4.

ROUTE STRUCTURE

Unlike the United States deregulation experience, the major airlines' route structures within Australia have not changed radically since regulatory reform. Part of the explanation lies in the fact that the nature of the regulatory regimes were different: the United States airline regulatory regime was proscriptive regarding route entry whereas Australia's was not. Another part of the explanation lies in the concentrated nature of the Australian domestic air passenger market. The top 20 routes in 1991–92 accounted for some 83 per cent of all passengers. The 37 routes that carry over 50 000 passengers per year, illustrated in figure 3.3, accounted for 92 per cent of passengers. Simple arithmetic suggests that more than 50 000 passengers per year are required to run a daily each-way service with a 100 seater jet aircraft at a 70 per cent load factor.[2] This has been a significant fact for the entry strategies of Compass Mk1 and Mk2, which concentrated on the relatively dense routes, and which will be examined in the next chapter.

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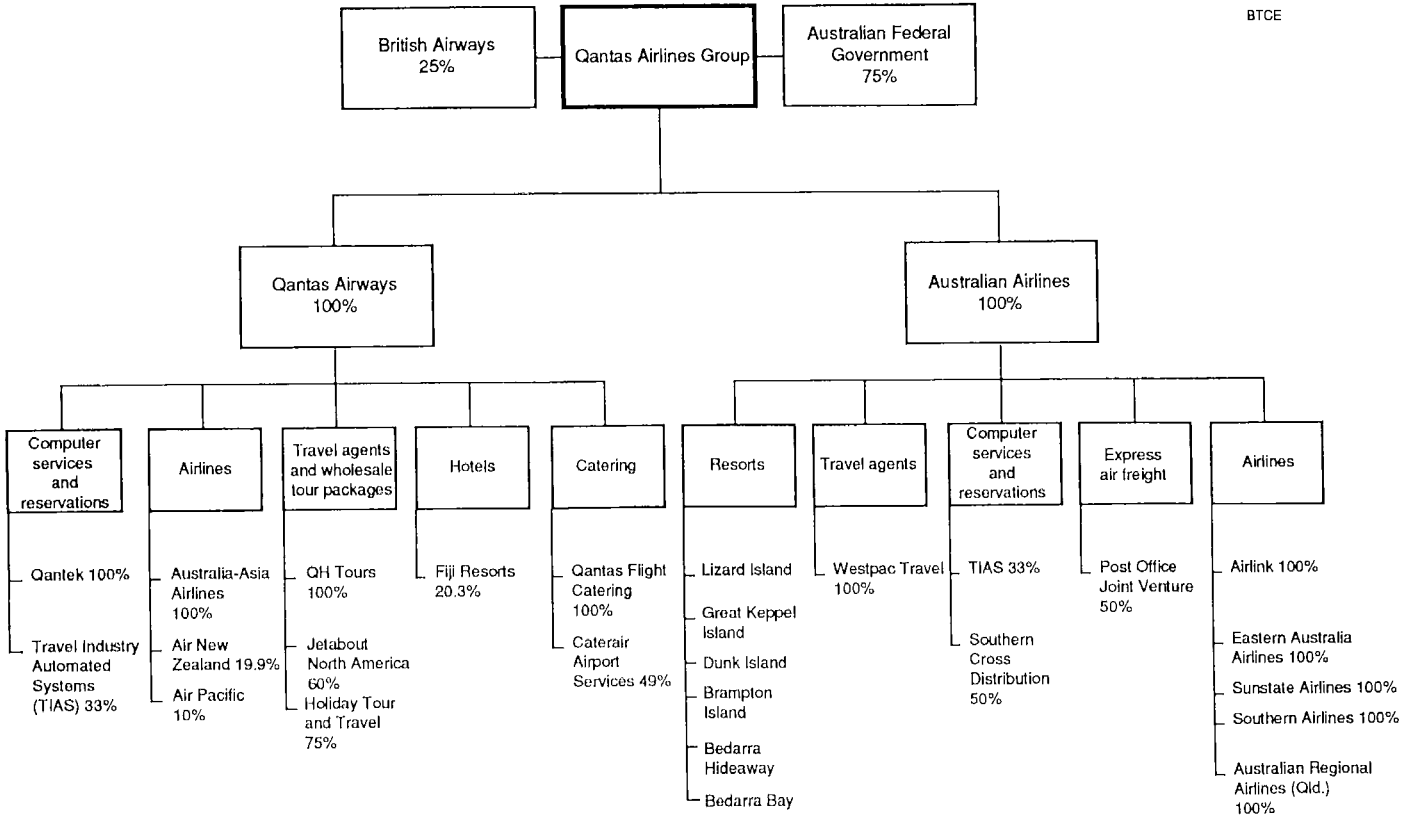
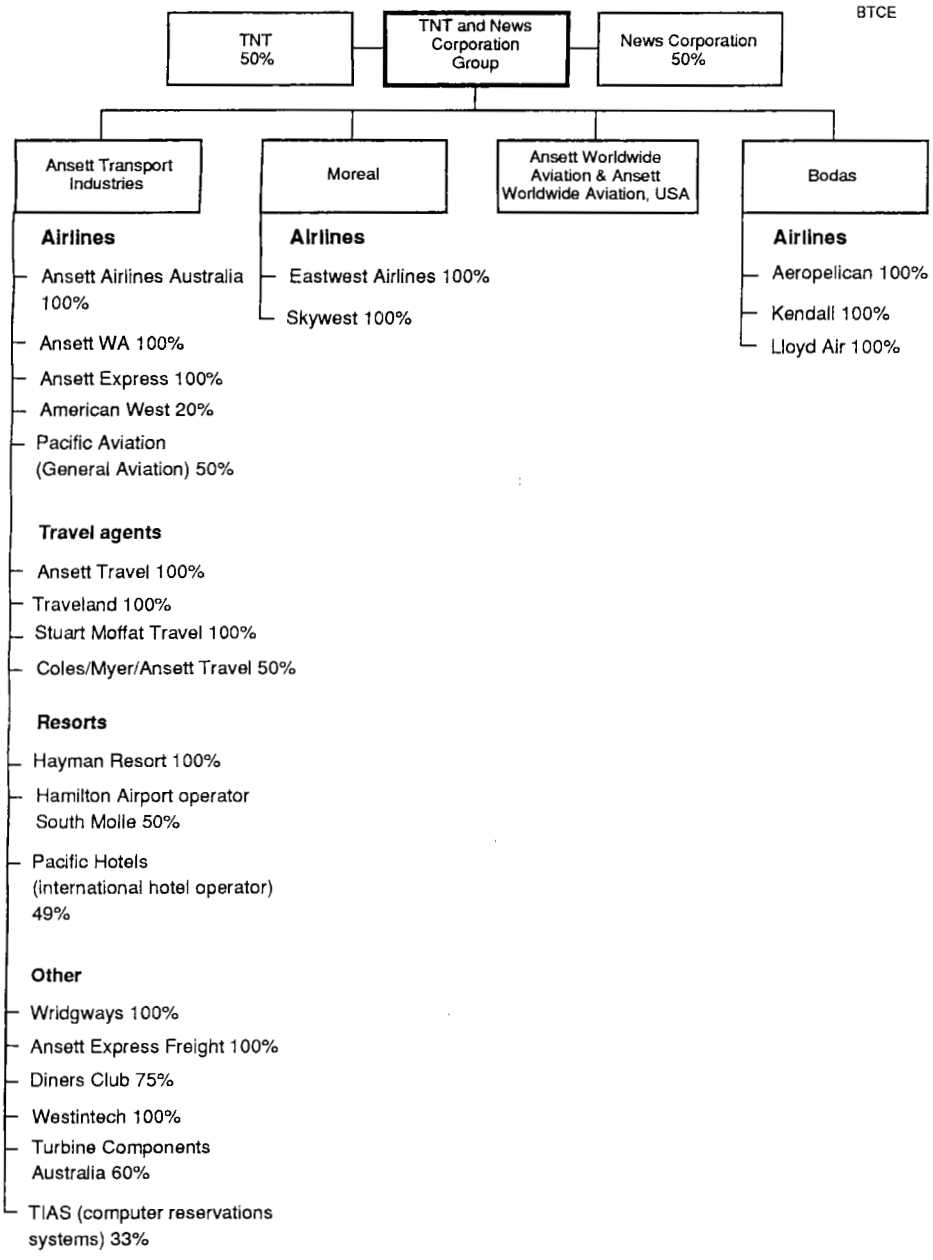
1. 'Air NZ joins Australian booking system', *Daily Commercial News*, 4 September 1992, p.13.
2. However, the less dense air routes may still be contestable by regional airlines using smaller jet aircraft or turboprops.



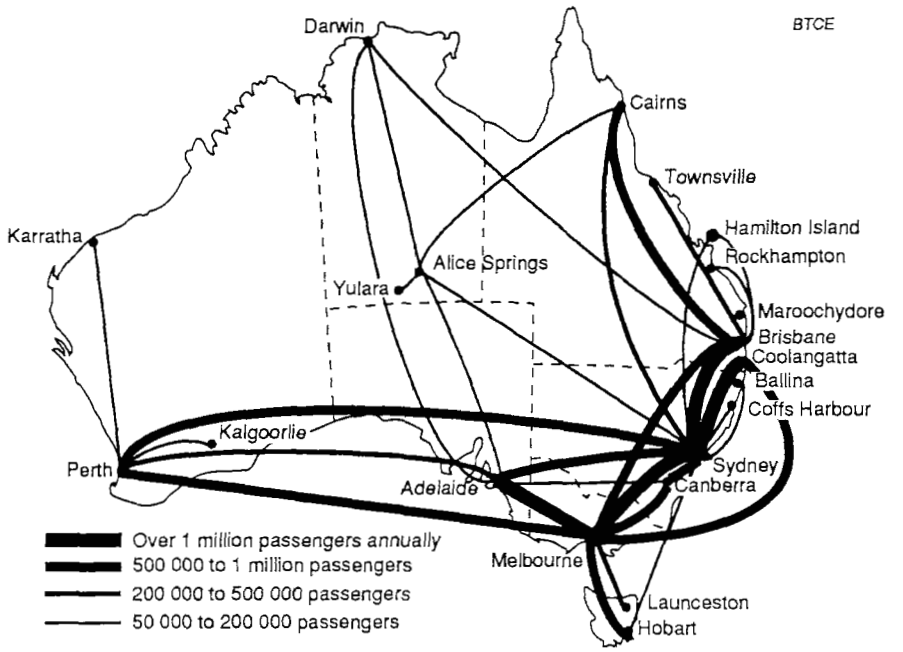
Sources Qantas and Australian Airlines Annual Reports 1991–92.

Figure 3.1 Qantas Airlines Group structure



Sources Annual Reports.

Figure 3.2 TNT and News Corporation Group structure of aviation interests 1992



Source DTC.

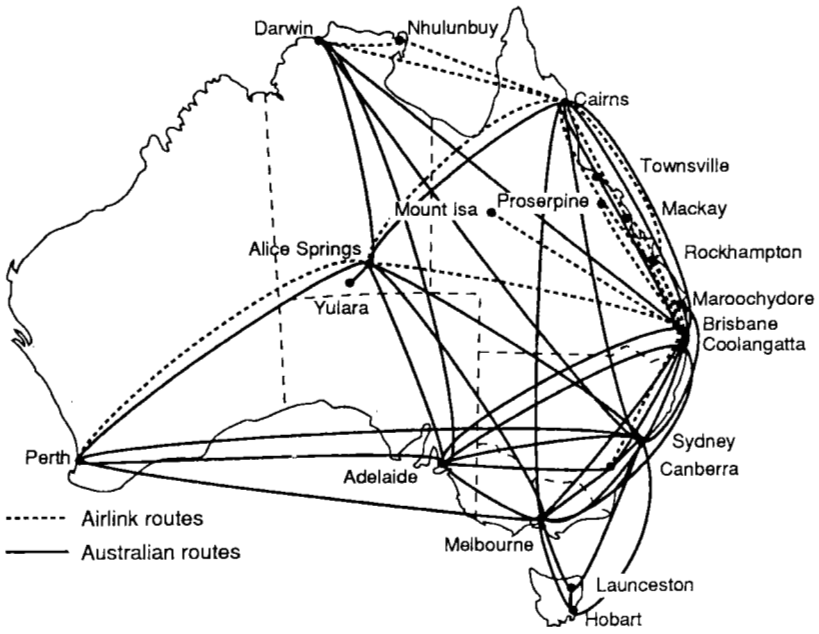
Figure 3.3 Major routes of the domestic airlines and route densities, 1991–92

Australian Airlines route network

Australian Airlines has jet services connecting 20 ports including all capital cities and most other major destinations: Alice Springs, Coolangatta, Cairns, Launceston, Mackay, Maroochydore, Mount Isa, Nhulunby, Prosperpine, Rockhampton, Townsville and Yulara. Within the limitations imposed by Australia's geography, demography and travel patterns, it makes considerable use of the opportunities available for hubbing through Sydney and Brisbane (see figure 3.4).

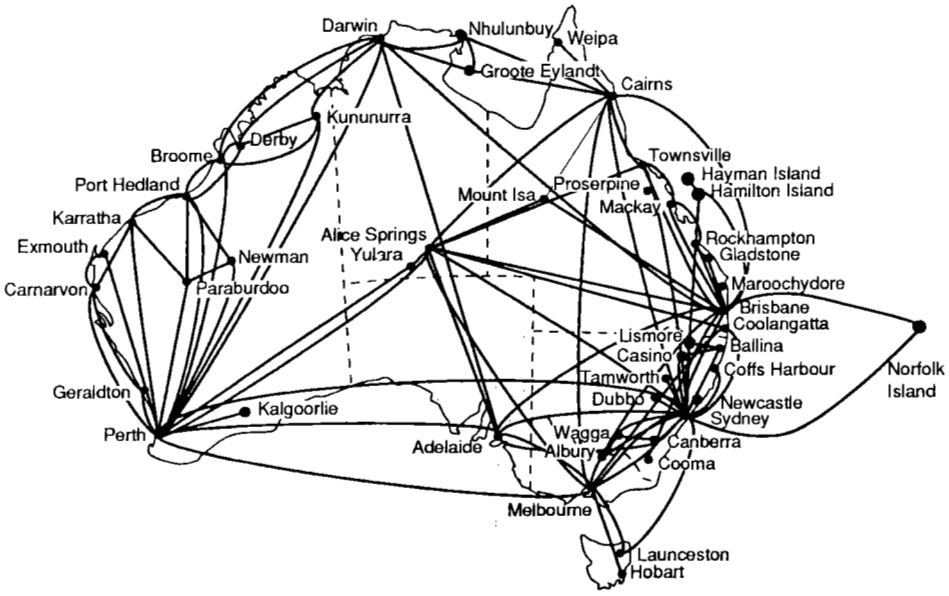
Since 1987, Australian has added Yulara and Maroochydore to its jet route network, and greatly increased flight frequencies on most popular routes. Australian commenced proceedings challenging Ansett's exclusive use of Hamilton Island's airport through the provisions of the Trade Practices Act. However, following Qantas' acquisition of Australian Airlines, the new entity was too preoccupied with absorbing Australian's operations and preparing for privatisation to carry on with the court action.

Australian's regional airline affiliates connect many other destinations in New South Wales, Queensland, South Australia and the Northern Territory. However, Australian lacks a route network in the (regulated) Western Australia intrastate market.



Source Australian Airlines timetable.

Figure 3.4 Australian Airlines routes 1992



Source Ansett Airlines timetable.

Figure 3.5 Ansett Airlines Group routes 1992

Ansett route network

Ansett serves approximately 21 ports in its own right and approximately 45 ports in conjunction with Ansett WA, Ansett Express and Eastwest. Like Australian, it connects the capital cities but, in conjunction with its subsidiaries and affiliates, it offers a wider network encompassing most of the important air travel destinations in Australia. In 1991 its subsidiary, Ansett Northern Territory, ceased operations and it no longer serves Katherine or Tennant Creek (see figure 3.5).

Like Australian, Ansett has greatly increased its frequency of services on most popular routes since deregulation. Ansett hubs many of its services through Brisbane, Perth and Sydney.

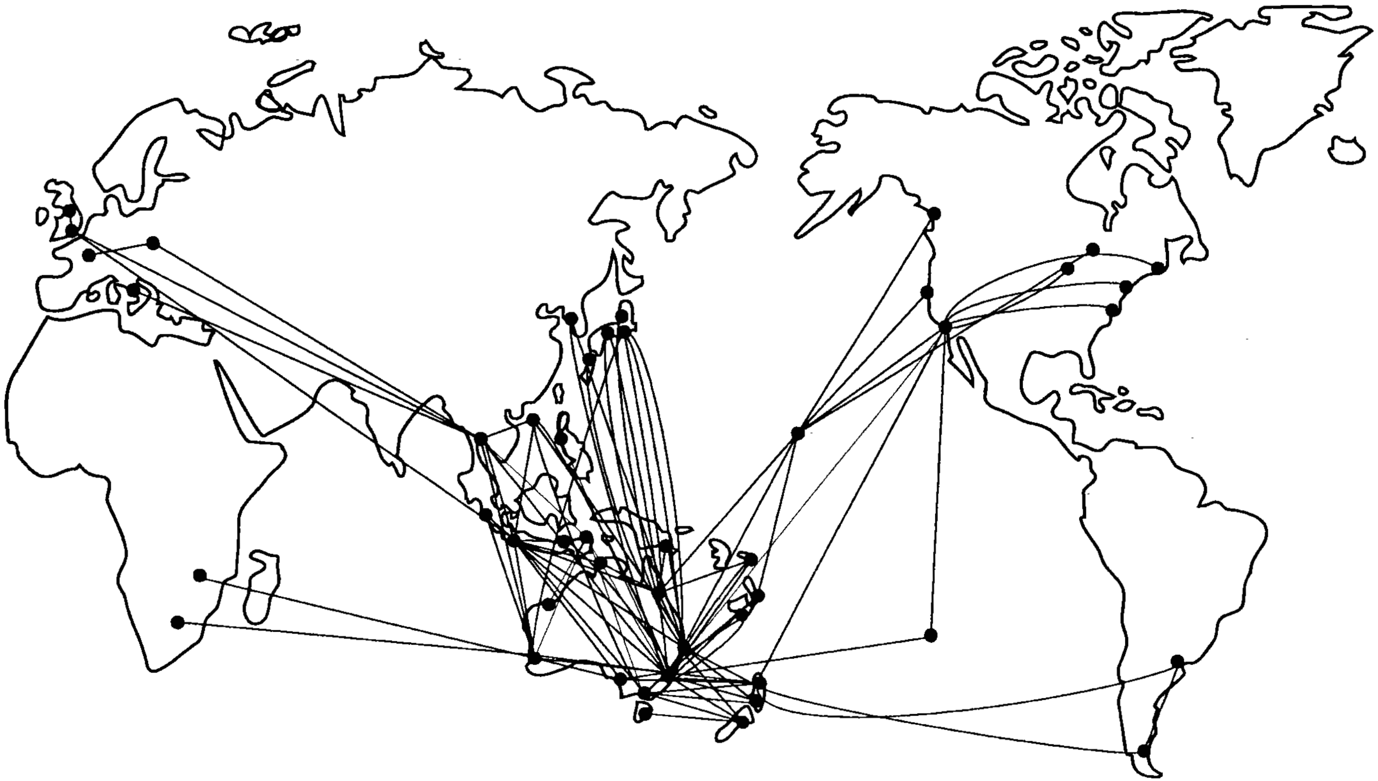
Qantas route network

Qantas today is a significant player in the market it serves — mainly passengers travelling to or from Australasia. Its major business, then, is in providing point-to-point services such as Auckland–Sydney or Sydney–Tokyo, although it takes advantage of some hubbing opportunities through Sydney, Cairns and Singapore. It offers services to 41 destinations (figure 3.6). It has no feeder carriers overseas, but its link with British Airways provides the opportunity to develop an each-way flow of connecting passengers. Moreover, its merger with Australian and permission to fly domestic passengers in its own right gives it important advantages in servicing both inbound and outbound travellers to and from Australia. Its relationship with British Airways enables it to participate in the supply of global airline services, as symbolised in a recent offer of round the world tickets for $A2200.

BREAKING DOWN COSTS IN THE AUSTRALIAN AIRLINE INDUSTRY

While it is easy to determine the total operating costs of the domestic airline operators in Australia, a detailed breakdown of the cost components is not so easily obtained. Examination of the annual reports of the Australian domestic operators and of Qantas and other international airlines yields data on many common comparable cost components. These documents, however, also reveal a wide range of different reporting methods with individual items often hidden in broad cost groupings, making disaggregation and comparison difficult. Many airlines choose not to provide details of operating costs in their annual reports, and publish only their balance sheet for the year.

Unfortunately, the Australian domestic operators are among those who do not provide comprehensive cost breakdowns, and the reports of Qantas and other international operators were used to determine some of the cost distribution of Australian operators, although Australian domestic data were taken into account wherever possible.



Source Qantas

Figure 3.6 Qantas routes 1992

The majority of airline operating costs may be broken down as follows:

- labour
- fuel
- maintenance
- government charges
- ground handling
- leasing and interest costs
- depreciation
- insurance
- provisioning
- marketing
- administration.

Those companies which choose to publish their operating costs include most of the above cost items. The components most commonly quantified are total labour cost and fuel cost. Total labour costs were in the range of 21 to 33 per cent of total operating costs, with an average of 24 per cent. Fuel costs ranged from 10 to 21 per cent with an average of some 11 per cent.

Among the various reports there are large variations in the grouping and aggregation of 'other' cost components. For instance, some annual reports detail 'non-aircraft depreciation' and then include aircraft depreciation with 'total fixed aircraft costs'. Significantly, most of the reports have an item headed 'other' which accounted for up to 34 per cent of total operating costs and apparently included many major items which were not separately identified. Reporting practices such as these made it difficult to determine an average or typical cost framework from published data alone.

With the aid of the BTCE's Aerocost model, it was possible to resolve some of the aggregation problems found in the annual reports and construct a basic operating cost framework. As previously mentioned, fuel costs were well documented in the annual reports. Fuel is also one of the cost components calculated by Aerocost, so this common component was used to link Aerocost estimates to published costs. Aircraft use such large amounts of fuel, when compared with road vehicles, that it was decided that fuel costs in an airline operation can be reasonably attributed to aircraft alone, for the purposes of this exercise.

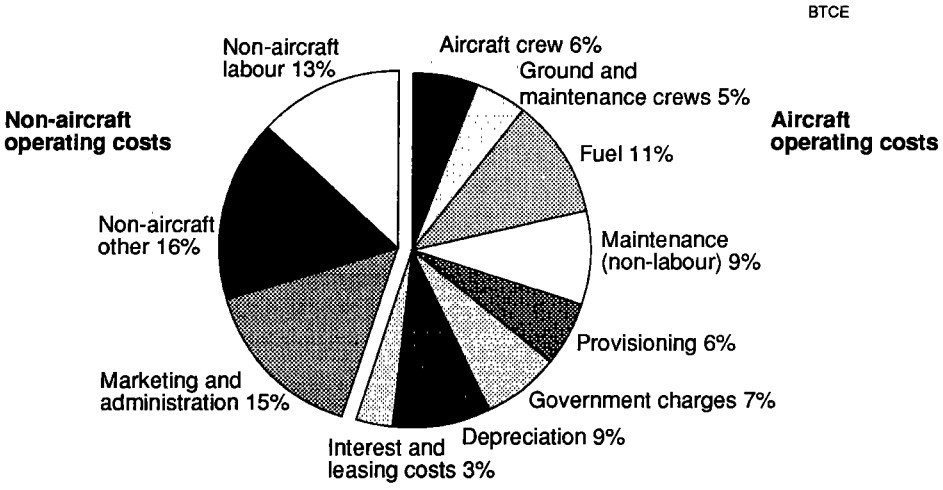
Aerocost estimates provide the cost of fuel, total aircraft maintenance (including labour), total aircraft capital cost (interest/leasing and depreciation), government charges, aircraft crew, and ground handling and provisioning. Fuel, labour, provisioning, depreciation, non-labour maintenance costs, and

non-labour marketing and administration costs were obtained from the published data. Various disaggregations were then possible, such as separating maintenance into labour costs and non-labour costs, and so on.

Note that the resultant cost distribution (figure 3.7) is only an estimate of that which might be typical of an operator in the Australian region. The underlying data were collated from various sources, having slightly different base years, and no adjustments were made for recent changes in the cost of components such as fuel or labour. Additionally, the construction of the cost distribution, as presented, required some simplifying assumptions. Consequently, the figures presented may only be used to indicate the relative significance of the various cost components, and do not reflect the actual costs experienced by a particular operator.

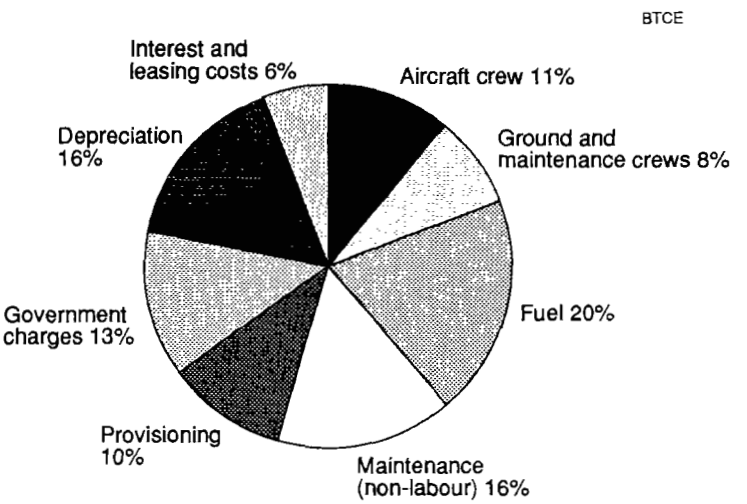
Estimated total airline operating costs are shown in figure 3.7. Non-aircraft operating costs account for some 44 per cent of total operating costs and aircraft operating costs account for the remaining 56 per cent. Non-aircraft costs are made up of labour, marketing and administration, and 'other' costs. The 'other' category comprises costs associated with provision of premises and equipment, terminal leases, tourism and travel services, and a few other minor miscellaneous items.

Aircraft operating costs (figure 3.8) are made up of: fuel 20 per cent, aircraft depreciation 16 per cent, maintenance (non-labour) 16 per cent, government charges 13 per cent, aircraft crew 11 per cent, provisioning 10 per cent, ground and maintenance crews 8 per cent, and interest and leasing costs 6 per cent.



Sources Airline annual reports, BTCE.

Figure 3.7 Total airline operating costs



Sources Airline annual reports, BTCE.

Figure 3.8 Aircraft operating costs

Remember that these percentages are only estimated industry averages, and that actual cost distributions are affected by many different factors.

Three areas which have come under scrutiny in efforts to improve airline performance since the process of aviation reform began have been labour force productivity, aircraft utilisation efficiency and redundancy in aircraft maintenance facilities. The structure of the airline labour force and aircraft fleets, being major cost elements, are examined in more detail below.

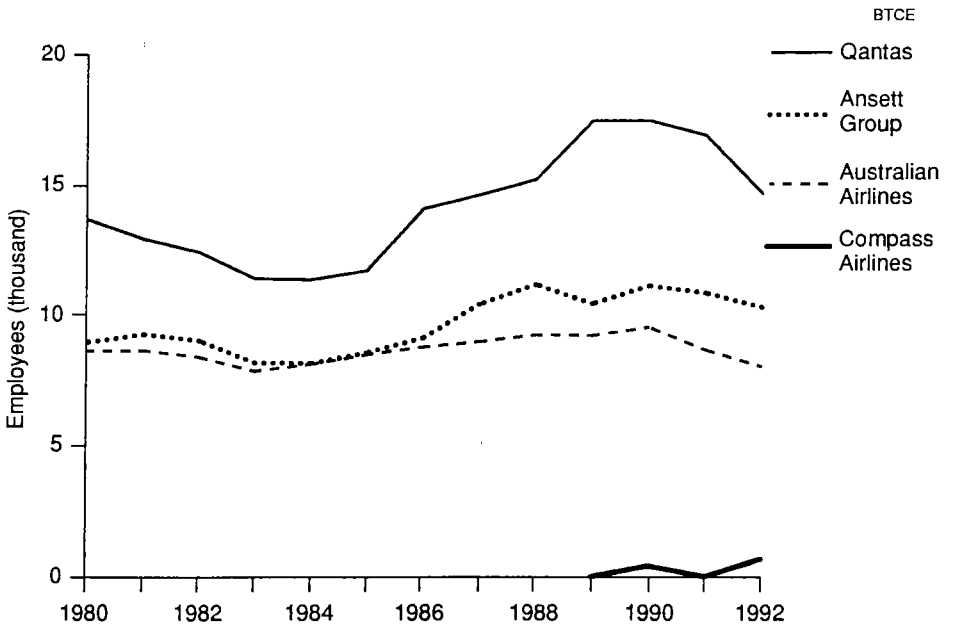
LABOUR FORCE

Employment in Australian-domiciled airlines has gone through three distinct phases over the past decade as can be seen from figure 3.9. (Details of the composition of the work forces of the major airlines since 1980 are given below in table 3.1.) In the early 1980s, all the major airlines were making operating losses. In response they made strenuous efforts to cut costs and therefore their labour forces. This was followed by an expansionary phase starting in about 1983 in which airline labour forces grew strongly along with the overall size of airline operations and activity. The mass resignation of domestic airline pilots on 24 August 1989 was a marker for the commencement of the next phase. The airlines have been grappling with deregulation and privatisation through, among other things, closer attention to labour force productivity. This has led to a shake-out in airline industry employment while, at the same time airline capacity and activity have been increased.

The structures of the work forces in the major airlines are depicted in figures 3.10 and 3.11. It can be seen that Qantas employment is made up of nearly one quarter in each of the categories of 'maintenance and overhaul', 'ticketing and sales' and 'other' (for example management, accounting, planning). Flying staff (pilots, flight engineers and cabin attendants) account for about 30 per cent of employees.

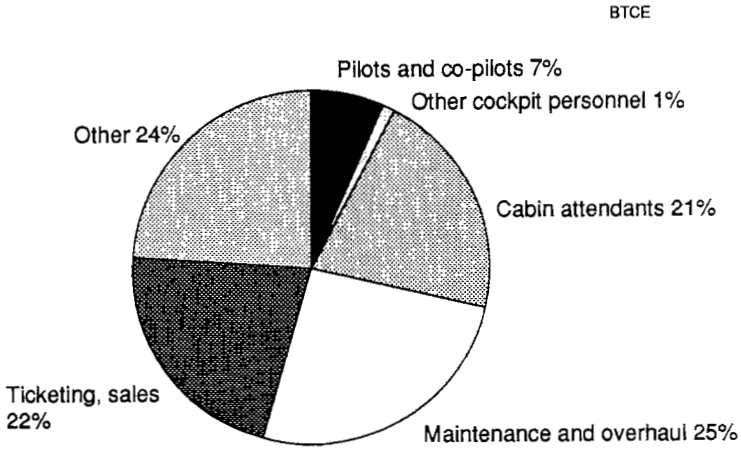
At Ansett and Australian, the 'other' category of employees occupies a much higher proportion of the total work force, compared with Qantas. Flight crew, maintenance and ticketing categories are correspondingly lower.

It is believed that this is explained by the following factors. Firstly Qantas is a long-haul airline and requires a higher proportion of flight crew. Secondly, Qantas does a lot of engineering and maintenance work for outside clients, increasing its need for maintenance and overhaul staff. Thirdly, Qantas has sales offices around the world, increasing its need for ticketing and sales staff. At the same time, the higher proportion of 'other' staff at Ansett and Australian may be explained by their direct employment of all their baggage handlers and other airline terminal staff and the large number of subsidiaries which each of these groups manage. Australian has a joint venture with Australia Post, owns travel agencies, Barrier Reef island resorts and regional airlines. Ansett owns and provides support facilities for numerous regional airlines and



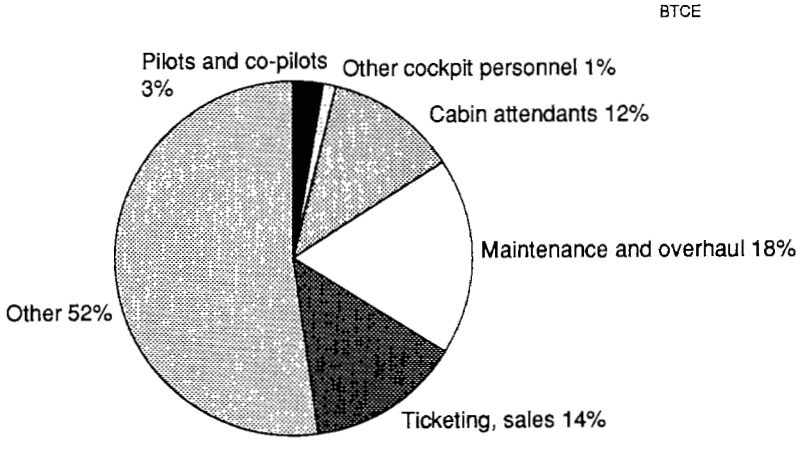
Sources ICAO, airline Annual Reports, May Report, BTCE estimates.

Figure 3.9 Airlines personnel



Source Table 3.1.

Figure 3.10 Qantas: proportion of employees in each category



Source Table 3.1

Figure 3.11 Ansett and Australian: average proportion of employees in each category

TABLE 3.1 AIRLINES PERSONNEL, 1980 TO 1992[a]

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989[b]	1990	1991[e]	1992[e]
Airlines of South Australia													
Total	124	130	132	127	129	119	–	–	–	–	–	–	–
Pilots and co-pilots	31	nr	35	38	37	33	–	–	–	–	–	–	–
Other flying personnel	32	nr	37	35	39	36	–	–	–	–	–	–	–
Maintenance and overhaul	–	–	–	–	–	–	–	–	–	–	–	–	–
Ticketing, sales and other	61	nr	60	54	53	50	–	–	–	–	–	–	–
Air Queensland[c]													
Total	–	–	74	308	310	323	331	–	–	–	–	–	–
Pilots and co-pilots	–	–	24	97	87	88	94	–	–	–	–	–	–
Other flying personnel	–	–	16	24	35	37	45	–	–	–	–	–	–
Maintenance and overhaul	–	–	15	89	83	90	94	–	–	–	–	–	–
Ticketing, sales and all other	–	–	19	98	105	108	98	–	–	–	–	–	–
Ansett Express[d]													
Total	288	296	287	269	263	296	314	332	328	238	309	301	300
Pilots and co-pilots	80	nr	74	76	85	92	100	105	111	40	nr	nr	nr
Other flying personnel	62	nr	67	64	67	83	92	98	92	86	nr	nr	nr
Maintenance and overhaul	–	nr	–	–	–	–	–	–	–	–	nr	nr	nr
Ticketing, sales and all other	146	nr	146	129	111	121	122	129	125	112	nr	nr	nr
Ansett NT[f]													
Total	–	–	25	24	24	25	28	28	34	28	27	–	–
Pilots and co-pilots	–	–	–	–	–	–	–	–	–	–	–	–	–
Other flying personnel	–	–	–	–	–	–	–	–	–	–	–	–	–
Maintenance and overhaul	–	–	–	–	–	–	–	–	–	–	–	–	–
Ticketing, sales and all other	–	–	25	24	24	25	28	28	34	28	27	–	–

TABLE 3.1 AIRLINES PERSONNEL, 1980 TO 1992[a] (Cont.)

	1980	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*[b]	*1990*	*1991*[e]	*1992*[e]
Ansett of Australia													
Total	8124	8419	8169	7350	7391	7792	8312	8568	9470	9059	9611	9500	9500
Pilots and co-pilots	nr	nr	nr	700	548	527	562	583	623	202	309	nr	nr
Other flying personnel	nr	1692	1633	807	931	1075	1199	1164	1211	1259	1226	nr	nr
Maintenance and overhaul	nr	2133	2059	1717	1681	1728	1845	1929	2066	2136	1782	nr	nr
Ticketing, sales and all other	nr	4594	4477	4126	4321	4462	4706	4882	5470	5462	6294	nr	nr
Ansett WA[g]													
Total	540	536	530	506	447	428	465	412	489	379	406	400	400
Pilots and co-pilots	nr	102	110	107	105	106	114	115	149	47	75	nr	nr
Other flying personnel	nr	93	97	95	118	142	162	138	170	171	173	nr	nr
Maintenance and overhaul	nr	13	–	–	–	–	–	–	–	–	–	nr	nr
Ticketing, sales and all other	nr	328	323	304	224	180	189	159	170	161	158	nr	nr
Australian Airlines													
Total	8620	8620	8377	7825	8084	8459	8764	8960	9242	9218	9534	8649	8000
Pilots and co-pilots	593	593	570	517	498	501	556	556	545	85	287	307	330
Other flying personnel	884	884	969	1011	962	1039	1086	1110	1124	1269	1164	1229	1290
Maintenance and overhaul	1801	1801	2115	1868	1875	1932	1991	1757	1763	1669	1757	1422	nr
Ticketing, sales and all other	5342	5342	4723	4539	4749	4987	5131	5537	5810	6195	6326	5691	nr
Compass Airlines													
Total	–	–	–	–	–	–	–	–	–	–	411	–	670
Pilots and co-pilots	–	–	–	–	–	–	–	–	–	–	31	–	65
Other flying personnel	–	–	–	–	–	–	–	–	–	–	192	–	102
Maintenance and overhaul	–	–	–	–	–	–	–	–	–	–	89	–	90
Ticketing, sales and all other	–	–	–	–	–	–	–	–	–	–	99	–	413

TABLE 3.1 AIRLINES PERSONNEL, 1980 TO 1992[a] (Cont.)

	1980	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*[b]	*1990*	*1991*[e]	*1992*[e]
Eastwest													
Total	531	552	580	630	667	781	nr	1072	864	728	774	648	400
Pilots and co-pilots	109	108	nr	121	139	169	nr	147	139	64	73	76	nr
Other flying personnel	78	81	nr	93	106	123	nr	157	136	116	130	132	nr
Maintenance and overhaul	190	140	nr	158	160	169	nr	205	230	247	213	108	–
Ticketing, sales and all other	154	223	nr	258	257	320	nr	563	359	301	358	332	nr
Qantas													
Total	13702	12942	12420	11407	11358	11710	14107	14629	15226	17481	17469	16900	14700
Pilots and co-pilots	545	523	488	484	nr	nr	691	749	870	1012	1200	nr	nr
Other flying personnel	2273	2324	2277	2158	nr	nr	3006	3078	3491	4029	3804	nr	nr
Maintenance and overhaul	3915	2712	2682	2518	nr	nr	3201	3206	3548	4400	4490	nr	nr
Ticketing, sales and all other	6969	7383	6973	6247	nr	nr	7209	7596	7317	8040	7975	nr	nr

– Zero
e Estimate
nr Not separately recorded

a. Number at year end.

b. Mass resignation of pilots on 24 August 1989.

c. Air Queensland was a wholly owned subsidiary of Australian Airlines which was wound down after 1986 under the new return on investment guidelines of a government business enterprise.

d. Formerly Air NSW.

f. Ansett NT ceased operations in April 1991.

g. Formerly Airlines of Western Australia.

Note Other airlines of earlier days were Bush Pilots Airways, Macrobertson Miller and Connair. Bush Pilots' name was changed to Air Queensland in 1985 and was consolidated into the group accounts of Australian Airlines. Ansett took control of Macrobertson Miller and made it Ansett WA. Connair was taken over by East-West in 1980.

Sources ICAO, airline Annual Reports, May Report (1986), BTCE estimates.

Eastwest, operates Ansett Wridgways, Ansett Freight Express, various travel agencies and resorts, numerous manufacturing, trading and service enterprises and manages its investments in Ansett Worldwide Aviation Services, America West and Ansett New Zealand.

AIRCRAFT FLEETS

The size, age and shape of existing and planned aircraft fleets is relevant to the scope for new entrants to contest the market in terms of offering new categories of service and through expanding capacity to meet untapped demands.

In 1990, airlines around the world and especially in the United States, were still in an expansion phase from the boom years of 1988–89 and there was a shortage internationally of both aeroplanes and pilots. This situation changed rapidly with the advent of the 1990s world economic depression, the Gulf conflict and the collapse of a number of airlines including Eastern, Pan Am and Midway Airlines in the USA in 1991. In mid 1991, there were approximately 850 jet passenger aircraft readily available,[3] most of them parked in the Mojave Desert in the United States, and available to any airline wishing to expand.

The impact on Australian-domiciled airlines of the international market for aircraft has been slight as the major airlines have planned their fleet acquisitions well in advance. All the major airlines have been managing a process of fleet expansion and modernisation, partly through aircraft purchases and sales and partly through lease agreements. An exception may be that with the merger of Qantas and Australian, Australian now has four Airbus A300's to sell which no longer fit in with an otherwise all Boeing fleet, but it is waiting until market conditions improve, before selling. At 30 June 1992, Qantas had 16 new Boeing B747-400's and had plans to acquire another 29 as well as seven Boeing B767-338ER aircraft, and to dispose of its B747SP and some of its B747-200 aircraft. Australian was about two-thirds of the way through its expansion and upgrade, with 15 Boeing B737-400 aircraft replacing ten B727-200's. Australian grounded one of its Airbus A300's from January to October 1991 and leased out two of its new B737-400 aircraft for most of 1991. Its fleet is again fully utilised. Ansett had completed its expansion plans for the time being with the acquisition of 12 Airbus A320's. It had plans for the acquisition of ten Airbus A321's after 1995. Eastwest expanded and upgraded, including the replacement of its seven Fokker F28's with eight British Aerospace BAe 146's and then replacement of one BAe 146

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3. *Avmark Aviation Economist*, January/February 1993, p.8. Many of these aircraft would be noisy, expensive to operate and have poor maintenance records and will never be flown again. However, there is a significant surplus of usable aircraft.

TABLE 3.2 AIRLINES PASSENGER FLEET COMPOSITION

Aircraft	*30 Jun. 1990*	*31 Dec. 1990*	*30 Jun. 1991*	*31 Dec. 1991*	*30 Jun. 1992*	*31 Dec. 1992*	*Planned*
Ansett							
B767-200	5	5	5	5	5		10 A321-100's to be added
A320	8	8	11	11	12		between 1995 and 1999
B727-200	5	5	5	6	5		
B737-300	15	15	15	16	16		
Total	33	33	36	38	38		
Ansett Express							
F28-4000	–	2	3	5	5		
F28-3000	–	2	2	2	2		
F28-1000	2	2	2	2	2		
F50	7	7	6	4	5		
Nord 262	–	–	–	2	2		
Total	9	13	13	15	16		
Ansett WA							
BAe146-200	5	5	5	5	5		
F28-4000	1	2	2	2	2		
F28-1000	3	3	3	3	3		
Total	9	10	10	10	10		
Australian Airlines							
A300-200	4	4	4	4	4		Merger with Qantas will
B727-200	10	10	9	9	7		result in disposal of A300's;
B737-400	2	4	5	8	9		15 B737-400's to be added;
B737-300	15	16	16	16	15		B727's to be decreased to 0.
Total	31	35	34	37	35		
Australian Airlink							
BAe146-100	na	na	na	3	4		

TABLE 3.2 AIRLINES PASSENGER FLEET COMPOSITION (Cont.)

Aircraft	*30 Jun. 1990*	*31 Dec. 1990*	*30 Jun. 1991*	*31 Dec. 1991*	*30 Jun. 1992*	*31 Dec. 1992*	*Planned*
Compass Airlines Mk1							
A300-600	na	2	3	na	na	na	(Ceased operations
A310-300	na	–	–	na	na	na	20 December 1991)
Total	na	2	3	na	na	na	
					na	na	
Compass Airlines Mk2							
MD80	na	na	na	na	na	5	(Ceased operations 12 March 1993)
Eastwest Airlines							
BAe 146-300	–	5	7	8	7		
F 28-4000	5	3	1	–	–		
F 28-3000	2	–	–	–	–		
B727-200	–	–	–	–	1		
Total	7	8	8	8	8		
Qantas							
B 747-200	14	14	6	5	5		8 B747-438's to be added
B 747 Combi	2	2	2	3	2		before June 1995;
B 747SP	2	2	2	3	2		19 B747-400's to be added
B 747-300	6	6	6	6	6		after 1995;
B 747-400	–	8	11	14	16		7 B767-338ER's to be added
B 767-200	7	7	7	7	7		between 1995 and 1998
B 767-300	4	6	8	12	12		
Total	41	45	42	48	50		

na Not applicable (airline not operating)

Source Department of Transport and Communications.

with a share arrangement with Ansett in two B727's. The surplus F28's were distributed to Ansett regional subsidiaries.[4] Table 3.2 provides details of the composition of Australian airline passenger fleets.

The following chapter examines the economic forces which determine airline industry outcomes. Scope for entry into the Australian domestic market is considered in detail.

4. The aircraft fleets of Compass Mk1 and Mk2 are discussed in chapter 5 in a special section analysing their entry strategies and performance.

CHAPTER 4 AIRLINE ECONOMICS AND SCOPE FOR ENTRY

Airline industry outcomes are determined through interactions between supply and demand. Supply and demand forces ultimately determine industry structure which in turn influences the conduct of industry players and thus their performance. The most notable demand and supply forces for the purposes of this report are the strong forces favouring the longer term survival of large airlines. While scope for niche airlines and new entrants may exist, the conditions for successful entry are quite onerous.

FORCES OF SUPPLY AND DEMAND

The conditions under which airlines operate are determined by the interaction of the costs of production (or supply forces) and the nature of consumers' wants and needs (demand forces). The airline operates to maximise its profit; however, it is constrained by the technological limitations on what kind of airline service can be delivered, the relative fixity in the supply of certain inputs, such as airspace and landing slots, and what it costs in resources to deliver the service. Interacting with these supply factors are the demand forces. If an airline is to be competitive it must understand the nature of consumers' needs and must adopt a pricing and service strategy that matches what the consumers are prepared to buy.

What follows below is a summary of the basic supply and demand characteristics of the airline industry.

Supply

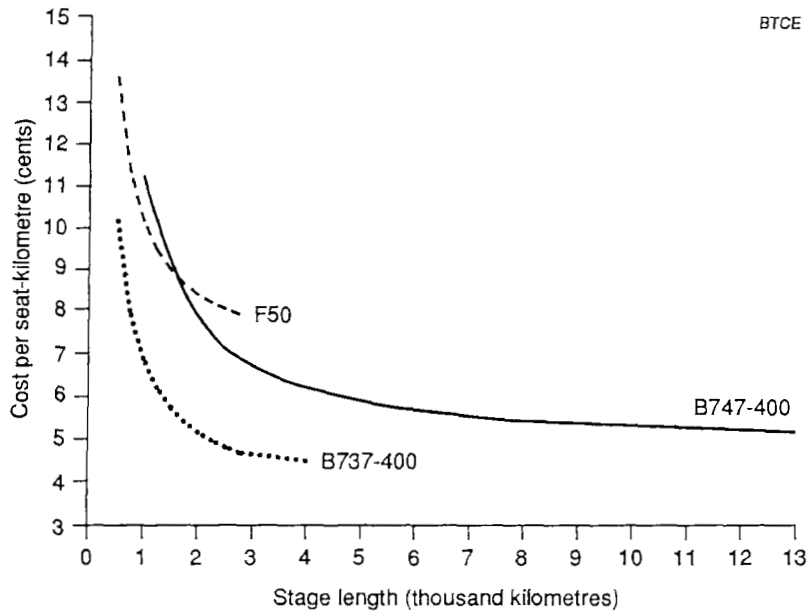
Costs

The cost of producing an airline service is the basic supply force. In order to maximise profits, airlines attempt to produce the service at the minimum possible cost, and in order to compete within a market, airlines are driven to supplying the service at this cost. Their ability to do this, however, depends upon such factors as the efficiency of their management, access to factors of

production, factor utilisation and productivity, tax liabilities and credits and financing arrangements.

Despite the range of factors influencing the cost of providing a service, there is a tendency for airline costs to vary according to the following airline characteristics:

- Cost per seat generally declines with the size of the aircraft. This is because the fixed cost components of aircraft operation can be spread over more passengers.
- Cost per kilometre flown declines with the stage length (distance) of the flight. However, an aircraft designed to fly long distances (for example, the B747-400) will not be as cheap to fly over short distances as some smaller aircraft specifically designed to be used over short distances. Propeller driven aircraft are cheaper than jets over short stage lengths and small payloads. This is because the take-off and landing costs are the larger components of flight costs. Figure 4.1 shows how costs decline with stage length (for a load factor of 70 per cent) for three different aircraft types used in Australia.
- Cost per passenger declines as the load factor (percentage of seats filled with paying passengers) increases towards 100 per cent. This is because the fixed components of aircraft operating costs can be distributed among more passengers.
- Cost per passenger falls as an airline delivers more passengers within a network of given size (referred to as economies of traffic density). Economies of traffic density flatten out at route densities of about 40 million revenue tonne-kilometres per point served (Tretheway 1991b; Gillen, Oum & Tretheway 1985a). Once again, this is because fixed capital costs can be distributed among more passengers. This is probably the most significant factor on the supply side with respect to the implications for industry structure, and is discussed in greater detail below.
- Costs are constant with respect to changes in other parameters of airline size. For example, if the amount of traffic per route were held constant, adding additional routes or cities to a network would not significantly alter costs per passenger over the total network. This is because, in this instance, the fixed costs tend to increase proportionately with the number of passengers carried.
- Costs per passenger increase with improvements in certain dimensions of the quality of service. For example, if an airline were to increase flight frequency on a route with a given route density to improve its timeliness, the airline would need to replace larger aircraft with an increased number of smaller aircraft. As discussed above, however, the cost per seat would increase with the reduction in the size of the aircraft used. Similar increases in associated costs result from improvements in safety and passenger comfort.



Source BTCE.

Figure 4.1 Cost per seat-kilometre by stage length at 70 per cent load factor

It is also believed that costs per passenger tend to increase with the number of different aircraft types operated by an airline. Observation of airline operations also appears to support the belief that airlines are unable to economically offer a wide range of classes of service, with three being the commonly observed maximum.

Route density

Caves, Christensen and Tretheway (1984) point out that growth in output is ambiguous in transport industries such as airlines due to the network-orientated nature of the service provided. Output growth *within* an existing network (increase in output density) is likely to have a different impact on costs than output growth due to expanding the size of the network (increase in scale). For airlines, the first is likely to result in a significant cost reduction per unit of output (described as economies of route or traffic density), whereas the second is unlikely to have any effect on costs for the reasons outlined in the previous section.

Overseas studies (Gillen, Oum & Tretheway 1985a) have shown significant economies of traffic density up to about 40 million revenue tonne-kilometres (RTK) per point served (for example, the levels reached by Air Canada in 1982). These returns to density result from the fixed costs associated with a

network, costs which are independent of the level of output. Gillen et al. nominate promotional expenses within a given network and maintenance, administrative, and passenger and traffic servicing units as cost items of this type.

It is important to note that economies of route density are the only supply characteristic which has implications for the number of carriers in the market. If an airline is to successfully compete in a market, it must either achieve an equal density to that of its competitors or increase its route density to the minimum size necessary to capture all available density economies.

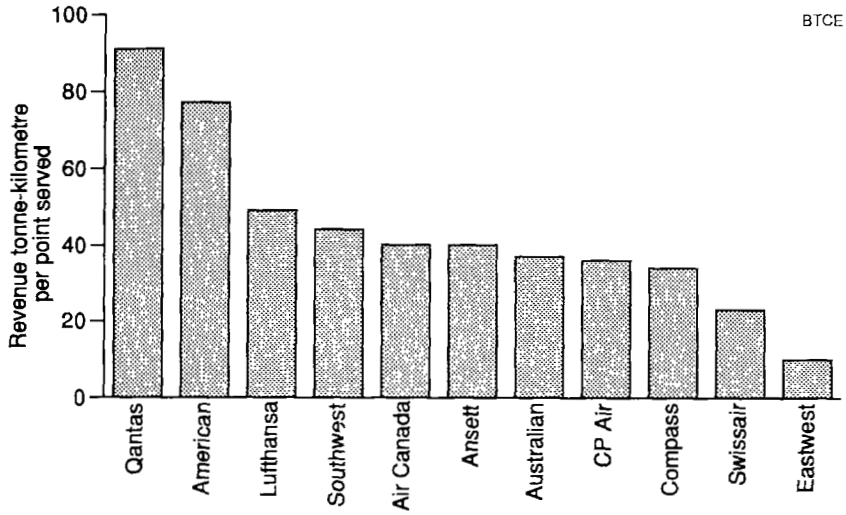
Of the Australian domiciled airlines, Qantas has a very high traffic density by any standard and is likely to have fully exploited the available traffic density economies. In the year ending 30 June 1991, it delivered approximately 91 million RTK per port served. On the other hand, the major Australian domestic airline networks appear to be at, or smaller than, the size necessary to fully exploit available traffic density economies. Airline traffic density statistics for Australian and selected overseas airlines are shown in figure 4.2 and the details are in table 4.1. In the year ended 31 December 1991, Ansett Airlines delivered approximately 40 million RTK per port served. Australian delivered about 37 million, Compass delivered about 34 million and Eastwest 10 million. However, the differences in route density themselves are not so great as to imply large differences in costs per unit of output, with the exception of Eastwest.

TABLE 4.1 AIRLINE TRAFFIC DENSITIES

Airline	*Year*	*Traffic (million RTK)*	*Points served (no.)*	*Traffic density (million RTK per point served)*
Qantas	1991	3 721	41	91
American	1990	14 016	182	77
Lufthansa	1990	8 300	170	49
Southwest	1990	1 359	31	44
Air Canada	1982	2 559	64	40
Ansett	1991–92	833	21	40
Australian	1991–92	739	20	37
CP Air	1982	1 245	35	36
Compass	1991	168	5	34
Swissair	1990	2 526	109	23
Eastwest	1991–92	87	9	10

RTK Revenue tonne-kilometres

Sources Annual Reports.



Sources DTC, airline Annual Reports.

Figure 4.2 Airline traffic density

Consumer demand

Nature of the consumer

Controlling the costs of production is not sufficient to ensure that an airline will survive in a market. The service provided must be what the consumers want and be priced at an appropriate level. According to Tretheway (1991a; Tretheway & Oum 1992), as a general observation, airline consumers prefer airlines with large networks, due to the ease of obtaining information on schedules and fares. They also prefer to travel with a single airline on any one journey due to convenience of baggage handling and seat allocation. In addition, consumers have proven to be highly responsive to airline loyalty schemes such as frequent flyer reward schemes and airline clubs.

Demand for airline services is highly variable by time of day, day of week and by season. Airlines which have enough planes and terminal space to meet peak demands could have more than 50 per cent excess capacity in the troughs if the price of the service was to remain constant throughout each day and throughout the year.

Another important aspect of demand for airline services is that it is not homogeneous because consumers are not all demanding the same service.

In response, airlines differentiate airline travellers into numerous categories on the basis of their responsiveness to price–service-quality combinations. Product differentiation may be viewed as an industry means of enhancing market power but it is also important in tailoring supply to individual categories of consumer demand. One of the most important differences is between business and leisure demand. Some other categories are first class travellers, emergency travellers, international travellers with 'add-on' connections, package travellers, common interest group travellers, and child travellers.

Tretheway (1991a; Tretheway & Oum 1992) also records that demand for leisure travel is highly sensitive to price, and, in general, lowering price results in a more than proportionate increase in patronage. At lower prices leisure travellers are more likely to travel, and more likely to choose air instead of other modes of travel, and they are more likely to search for the lowest price across airlines. Leisure travellers generally are able to book their tickets well in advance, tend not to change their flight plans, and may be willing to travel at unpopular times.

In contrast, business travellers generally are less sensitive to price, although not totally 'inelastic'. They are however, highly sensitive to the quality of airline services and most importantly to timeliness (as determined by flight frequency, seat availability, directness of routing and on-time performance). Business travellers often book their tickets at the last minute before departure and need the ability to change their flight at short notice or even to get refunds on their tickets.

First class travellers, as with business class travellers, tend to be relatively insensitive to price but highly responsive to differences in service quality.

Pricing

As a result of the heterogeneous nature of consumer demand, airlines are able to practise price differentiation among categories of travellers (who are offered differentiated products) in order to maximise revenues. The two main techniques adopted by airlines to differentiate price are market segmentation and yield management.

Price differentiation by market segmentation involves offering higher quality services to the less price sensitive travellers. A traveller such as a business traveller, who is less responsive to price, may be induced to choose one airline over another and may be willing to pay more on the basis that the airline provides better service. A traveller who is highly responsive to price, generally a leisure traveller, may base the decision on whether or not to travel and which airline to choose on the basis of price. The leisure traveller may be able to get a lower price than the business passenger; however, in return service quality often has to be sacrificed.

Yield (or seat) management is what airlines call their complex pricing schemes designed to maximise revenue on every flight by attempting to extract the maximum price that consumers are willing to pay for the service. Yield management often appears paradoxical to outsiders because two passengers can appear to be receiving the same service while paying vastly different prices. The practice of yield management is possible because there is a difference in the services purchased due to the attachment of a range of conditions to the discount tickets.

The basis of yield management is in the accurate prediction of how many full fare travellers in a given seating configuration (for example, business, economy) will demand carriage on individual flights and to reserve as many seats as are necessary to accommodate them. The remaining seats are sold at varying levels of discount to the more price sensitive passenger (Tretheway 1991a; Tretheway & Oum 1992).

For yield management to be effective, the airlines must be able to quarantine high yield passengers from taking advantage of discount offers. This is done by attaching conditions to the cheaper tickets making the ticket unattractive to the high yield business passengers. For example, a deep discount ticket will typically be non-refundable, valid only for a particular flight on a given day, require a six-day or weekend stopover and must be booked and paid for 21 days in advance of travel. These conditions would not deter the price-sensitive leisure traveller but would be impractical for anyone travelling on business.

IMPLICATIONS FOR INDUSTRY STRUCTURE

The above discussion of the economic forces provides some clues as to the kind of structure likely to emerge in an unconstrained Australian airline industry and also whether that structure is conducive to more or less competitive behaviour and ultimately to good or better performance.

In the earlier literature the critical issue in terms of industry structure was considered to be whether airlines were a natural monopoly (May Report 1986). If they were then unit costs would decrease as an airline's size increased and competition in the market would not survive. This approach, however, is based solely on supply-side issues. It is now argued that more attention should be paid to demand-side forces and that airline size is perhaps not enough to determine the structure of the industry (for example Tretheway & Oum 1992).

Airline size within a network, however, can impact upon the level of competition within a market and thus have an effect on industry structure. The implication of the availability of economies of route density is that, if an airline is not to be disadvantaged with respect to its costs, it must be as big as its

competitors in terms of capacity supplied on individual routes. Furthermore, to capture all the available economies, it might need to offer a level of capacity which represented a very high proportion of demand on thin route networks. This amounts to saying that there might be a tendency towards natural monopoly characteristics in such cases.

Overall, the emerging structure in Australia's domestic aviation market is not final given the relatively short period of unconstrained market operations.

BARRIERS TO ENTRY

The failure of both Compass Mk1 and Mk2 to survive in the Australian domestic aviation industry raises the question of whether brand loyalty schemes and the ownership of key airline inputs constitute barriers to entry for new airlines. Although the frequent flyer programs and ownership of travel agencies, computer reservation systems and airport terminals were not discussed in depth in the Compass Prospectuses, they were raised in the context of the ability of both Compass Mk1 and Mk2 to compete once the airlines had commenced operations. In its report on the first year of domestic deregulation (BTCE 1991c), the Bureau examined the sources and importance of entry barriers in the Australian market; what follows is an analysis of those matters which have been highlighted as contributing to the collapse of Compass Mk1 and Mk2.

Brand loyalties of business passengers

A new entrant faces a number of disadvantages in competing with the incumbent airlines for the high-yielding business traffic. Frequent-flying business passengers are the established customers of the incumbent airlines and tend to demonstrate a high degree of brand loyalty. Business travellers are generally not particularly responsive to changes in price but are responsive to service quality. There are a number of service quality attributes that the incumbents, unlike smaller scale new entrants, can offer. These attributes include:

- high flight frequency;
- very good to excellent on-time performance;
- a wide route network; and,
- direct flight connections.

Another method used by the incumbents to ensure brand loyalty is airline clubs. Australian Airlines' Flight Deck and Ansett's Golden Wing offer members access to private lounges which include free food, alcoholic drinks and business facilities as well as frequent flyer bonuses (see box 4.1).

BOX 4.1 FREQUENT FLYER PROGRAMS

An important marketing goal for many companies including airlines is the use of various schemes aimed at the retention of customers on a long-term basis. A recent initiative of the airline industry in Australia, with this objective firmly in mind, has been the introduction of frequent flyer programs.

In these programs, passengers earn points for air travel, rental car use and for overnight stays at participating hotels. These points can then be exchanged for a wide range of items including air travel upgrades, airline tickets, accommodation, car rental, holidays as well as a wide range of merchandise goods. The main aim with such schemes is to attract and retain the loyalty of passengers who fly frequently.

Currently, both Ansett and Qantas/Australian offer frequent flyer schemes. Ansett and Qantas charge a modest $30 once-only joining fee (free to members of Flight Deck and Golden Wing). Compass offered a free frequent flyer scheme.

Ansett and Qantas schemes are very similar with both offering merchandise and free flight rewards based on the number of points accrued. Points are principally accrued on the basis of distance flown tempered by bonuses or discounts depending on the fare paid for travel. Additional points can be earned though the use of certain credit cards, hire cars and hotels. Compass rewards were based on the amount of money spent, that is, fares paid for travel; rewards included ticket upgrades, free flights and flight/accommodation packages.

Resulting from the merger of Australian and Qantas, in September 1992, was the amalgamation of their frequent flyer programs. From 15 September Australian Airlines frequent flyers were able to accrue points for trips undertaken on Qantas trips and vice versa. Hot on the heels of this development, Ansett established frequent flyer alliances with four international airlines, including United Airlines, Cathay Pacific, British Airways and All Nippon. Subject to some restrictions, trips undertaken on any of these carriers earn Ansett frequent flyer points and vice versa for members of these airlines' clubs flying Ansett while in Australia. The relationship with British Airways lapsed after British Airways' acquisition of 25 per cent of Qantas. In March 1993, Ansett announced frequent flyer links with Singapore Airlines.

In the past, benefits which accrued to travellers from participating in such plans have not been taxed. However, this has come to be questioned recently by the Australian Taxation Office. Under a draft ruling made in early July 1992 by the Australian Taxation Office, and subsequently passed in January 1993, members of frequent flyer schemes could be liable for income tax on the benefits they earn on work related travel. The ruling declares that benefits received by employees through such schemes do not constitute fringe benefits, on which the tax is paid by an employer. However, benefits received by a taxpayer, whether an employee or not, as a result of their participation in a frequent flyer program may constitute assessable income in the taxpayer's hands. The interpretation by the Taxation Office is that benefits received by a taxpayer which have a monetary value, other than non-cash business benefits, should be valued at a fair market value at the time the benefit is derived. The ruling will apply for years of income commencing 1 July 1992. For further explanation readers are referred to Taxation Ruling 93/2.

Compass management should have realised that, as a result of the up-front costs of joining these clubs and the bonuses resulting from the frequent flyer plans, business passengers are locked into club membership, and that there would be some delay before the frequent flyer business passenger would switch airlines. Despite this, Compass Mk2 spent as much as $2 million in setting up business class lounges at Melbourne and Sydney in an attempt to compete with the facilities offered by the incumbent airlines.

It would appear that the combination of the airline clubs, the frequent flyer bonus schemes and the service quality attributes offered by the incumbents hinders a new airline's ability to successfully enter the business market.

Another way in which frequent flyer programs provide incumbents with an advantage over a new airline is that individuals may travel for work and then use the bonus points accumulated for private use. This may create an incentive for individuals to continue travelling with one airline even when there is a clear advantage for the actual business in switching. It is almost impossible for new entrants to counteract such incentives. However, the taxation ruling discussed in box 4.1 may help to reduce the problem.

Despite the market power that the incumbents gain as a result of the frequent flyer programs, it would be extremely difficult to make such an activity illegal. The bonus points are similar in essence to loyalty bonuses which are offered in many other industries (for example, bingo cards distributed with newspapers or shopping bonuses offered by many of the major supermarkets in Australia). If it were argued that the frequent flyer programs were anti-competitive and should be stopped, then it could equally be argued that the other promotions based on the same concept should also be banned.

Travel agencies

There have been allegations that the approximately 80 per cent of travel agencies which are owned by the incumbent airlines have showed some bias in selling tickets, and that prospective customers have been told that Compass was not represented on the computer reservations system or that Compass prices were higher.[1] Compass is reported as selling only 42 per cent of its tickets through agents instead of the 50 per cent targeted in its Prospectus. Sam Coats, Compass' Chief Executive Officer, admitted in an interview that one of the major problems the airline encountered was in relation to the travel agency distribution network, which was dominated by agencies affiliated with rival domestic airlines. Despite this admission of the importance of gaining business from the travel agents, in December 1992 Compass management announced its intention to cut the commission rates to travel agents from 10 to 5 per cent plus overrides.

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1. Gallagher, J. 'Compass hurt by ticket lies: Coats', *Courier Mail,* 2 March 1993, p.28.

BOX 4.2 COMPASS MK2 EXPERIENCE WITH COMPUTER RESERVATION SYSTEMS AND TRAVEL AGENTS

Compass Mk2 contracted out the development of a suitable computerised reservation system to the Texas-based Electronic Data Services, a computer company owned by General Motors Co. Although Compass Mk2 originally had intended this new system to have last-seat availability with all travel agents, fare data obtained by BTCE from the Fantasia computer reservation system (CRS) showed that this was not the case, with the availability of Compass' discount fares being updated on the system on approximately a weekly basis. However, the system was apparently superior to the CRS used by Compass Mk1, which was only available through the Fantasia system and which at times resulted in travel agents operating on the alternative Galileo system having queue for up to two days to access reservations information on Compass Mk1.

In addition to the improvements to the actual CRS used, Compass Mk2 benefited from the introduction in January 1991 of the Trade Practices Commission code of conduct governing the operations of CRSs in Australia. This code of conduct meant that all travel agents would have equal access to Compass' CRS, regardless of which one of the three international reservations networks used in Australia (Abacus, Fantasia, Galileo) they were linked to.

A major problem associated with the use of CRSs in the United States was screen display bias. The CRSs used by the majority of the travel agents in the United States were owned and developed by airlines and it was found that flights of airlines not affiliated with the system did not appear on the initial screen displaying information on a given market. In a United States report to Congress in 1988, an American Airlines representative testified that 92 per cent of travel agent ticket sales in the United States came from the initial screen (Tretheway & Oum 1992). Given the high proportion of travel agent ticket sales from the first screen, this bias gave the airlines that owned the systems a significant advantage over the other carriers. BTCE examination of fare data on routes served by Compass, using the Fantasia CRS, indicated that this system did not suffer from such a bias.

Computer reservations

BTCE analysis indicates that there is no screen display bias against Compass Mk2 in the Fantasia computer reservations system (box 4.2).[2] However, there were problems with the display of last-seat availability information.

Airport terminal access

Compass Mk2 discussed access to terminals in its Prospectus and commented favourably on the longer term outlook for terminal access implied by the Prime Minister's commitment to the early development of common user

2. Fantasia is the Australian version, marketed under licence, of the Sabre computer reservations system owned by American Airlines.

BOX 4.3 ACCESS TO TERMINALS

At the time of the 1987 policy statement when the Federal Government announced that it would deregulate domestic aviation, it sought to ensure new entrants would have adequate access to airport terminal facilities. A difficulty that it faced, however, was that the incumbent airlines held long-term leases which generally ran well beyond the deregulation start-up date of October 1990.

In December 1987, just prior to the handover of management of airports to the FAC, the Government renegotiated terminal lease agreements with Australian and Ansett to ensure that new entrants would have access to a minimum level of facilities at each airport where common user facilities were not available. The renegotiated lease agreements required Australian and Ansett to provide gates to new entrants at their terminals: two each in Sydney and Melbourne; one gate each in Adelaide, Perth and Coolangatta; and one gate to be provided by Ansett at Launceston.

This arrangement was not intended to be a long-term solution but rather to ensure that new entrants had minimal terminal facilities from October 1990. At the time of the policy statement, it was recognised that in the long run the FAC would be responsible for the provision of terminal facilities subject to its normal commercial judgment.

Compass Airlines, being the only new entrant, took up the opportunities offered by the domestic terminal leases. While Compass was provided with terminal facilities at the airports from which it operated, the company asserted that the facilities provided at a number of major airports, particularly Adelaide, were unsatisfactory. This view was reinforced to some degree by the Trade Practices Commission (1992) which reported to the government on the reasons for the collapse of the company and found that Compass was disadvantaged to some extent in its ability to compete by the nature and terms of its access to terminal facilities.

In order to provide further scope for competition from other new entrants, the government recognised that there was a need for the early development of common user terminal facilities. In this respect the government decided to support the development of common user facilities at Sydney and Melbourne airports and to continue to liaise with the FAC to ensure their early completion. The government also decided to discuss with the FAC the need for developing subsequent facilities at Adelaide, Perth and Coolangatta airports. In March 1993, the government announced its intention to inject $113.1 million equity into the construction of common user terminals at Sydney, Melbourne and Coolangatta. Opportunities for growth in the industry were also to be provided by the government through the early construction of the satellite arrivals and departure centre at Melbourne airport and early completion of the new international terminal at Brisbane airport.

The early development of these facilities was expected to complement the government's announced changes in aviation policy, and to assist in stimulating competition in the domestic market, generate demand for the common user terminals and promote tourism.

terminals in the *One Nation* statement. However, it was also optimistic that it could operate independently of ground assistance if necessary given that the MD-80 series aircraft which it used are equipped with their own forward and rear stairs (box 4.3).

Conclusion on barriers to entry

Compass complaints about travel agent bias indicate a prima facie case for intervention by the Trade Practices Commission under section 46 of the *Trade Practices Act* (Misuse of market power).[3] Sam Coats is reported as saying that a consumer could file a legal suit if it was discovered that tickets could have been purchased 30 to 40 per cent cheaper and that aligned agents would lose accounts because they weren't giving clients full information.[4] The other potential barriers to entry, however, do not appear to have been critical for the success of Compass.

SCOPE FOR ENTRY

The available evidence suggests that the scope for entry into the Australian domestic airline market at a major level is quite restricted. This is quite apart from the psychological effects on the availability of risk finance and credit facilities of two successive new entrant airlines running into problems. Given the difficulties (as discussed above) facing new entrants in capturing a share of the existing market for business travel, difficulties which are inherent in the nature of the demand for the product, and the small amount of new demand which is generated by offering cheaper business travel, the ability of an entrant to compete in the business sector of the airline passenger market must be seriously questioned.

These considerations would appear to leave the discount leisure or genuine economy travel market as the area with most prospect for new entrant competition. This segment of the market is highly responsive to price, and the major airlines, in attempting to be all things to all travellers, do face a certain cost disadvantage. The cost advantage aspect has been highlighted by both Compass Mk1 and Mk2.

The overall economic situation is also important. It must be noted that the onset of the most serious recession in 60 years, almost simultaneous with domestic deregulation and lasting longer than anyone predicted, has seriously reduced the potential to stimulate demand. The airline business is very finely

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3. See Trade Practices Commission, Misuse of Market Power, A background paper, February 1990.
4. Gallagher, J. 'Compass hurt by ticket lies: Coats', *Courier Mail*, 2 March 1993, p.28.

balanced between profit and loss, and small differences in load factor and yield can mean the difference between success or failure. This was exemplified by the high degree of sensitivity to assumptions demonstrated in the Compass Mk2 Prospectus.

The demand factors examined above, combined with possible cost economies of route density, appear to be powerful forces favouring the longer term survival of large airlines. However, some independent regional airlines survive, and the trunk carriers typically operate their regional feeder airlines as independently managed concerns. The reasons may be a desire to minimise the number of aircraft types, differences in service levels, and differences in labour markets. An independent regional may be a springboard to contest the major domestic routes if other circumstances are favourable. Moreover, there may still be scope for 'niche' carriers if they are able to sufficiently differentiate their products or get access to lower cost inputs.

The incumbent airlines have demonstrated that they are resilient and resourceful competitors in all market sectors and are increasingly able to identify and market spare seats on a marginal cost pricing basis using yield management systems. The lessons are that new entrants must have large reserves, get everything right and be prepared for a long haul before profitability.

In the following chapter we will consider changes in structure which have occurred, in the light of our discussion of airline economics and scope for entry including strategic developments in the new entrant airlines, Compass Mk1 and Mk2, the incumbent airlines and other potential entrants.

CHAPTER 5 INDUSTRY STRUCTURAL DEVELOPMENTS

This chapter details some of the developments which have occurred in industry structure over the last two years. In particular, we have observed the demise of Compass Mk1 and Mk2, the amalgamation of Eastwest with Ansett, the takeover of Australian by Qantas and the experiences of potential entrants AAA and Transcontinental. These developments are consistent with the views formed in the previous chapter regarding airline economics and scope for entry.

RISE AND FALL OF COMPASS MK1

Major achievements

Compass Holdings Limited was incorporated on 2 July 1987, the prime objective being to establish and operate an Australian domestic airline. Bryan Grey was the company's founder and chief executive. On 17 May 1989 Compass issued a Prospectus for a public issue of 100 million ordinary shares of 50 cents each (that is, $50 million) with provision for oversubscription of up to $15 million. The issue was completely successful and raised the maximum $65 million.

Before Compass could commence operations, there were a number of prerequisites for airline operations that it had to obtain. These included:

- an Air Operator's Certificate from the Civil Aviation Authority — a technically demanding process which took eight months to complete;
- highly qualified flight crew — a plus factor which reflected well in Compass' flight operation: the aftermath of the airline pilots' dispute in Australia probably assisted in this in that it meant that Compass could pick and choose from a pool of highly experienced flight crew who resigned from the major airlines in July 1989;
- enthusiastic and helpful cabin crew, trained by Qantas — a plus factor which quickly gave Compass a good reputation for passenger assistance;

- terminal spaces at Sydney and Melbourne (sub-leased from Australian), Perth (temporary accommodation in the FAC international terminal), Brisbane (FAC common user terminal), Cairns (Cairns Port Authority) and Adelaide;[1]
- arrangements for training of staff and maintenance of aircraft;
- access to a computer reservation system — Fantasia/Sabre; and,
- leased aircraft — albeit with some delays and extra costs.

Compass Prospectus strategy

Compass strategy, as outlined in the Prospectus, was:

- to operate five wide-bodied Airbus aircraft on the main domestic trunk network, that is, between Sydney, Melbourne, Adelaide, Perth, Brisbane, Coolangatta and Cairns. This would cover the top 5 routes, 13 out of the top 20 routes and about 80 per cent of all the passenger traffic;
- to price peak and off-peak fares at 80 and 50 per cent respectively of the then current standard economy fares charged by Australian and Ansett Airlines; and,
- to offer a one-class only passenger service consistent with a lower-pricing strategy.

Apart from the assumptions made about air fares, Compass also anticipated an average load factor of 60 per cent, an exchange rate of US75¢ to the Australian dollar, and a fuel cost of 22¢ per litre. Based on these assumptions, Compass forecast a first year profit of $7.8 million, increasing to $9.1 million in the 1991–92 financial year and $11.3 million in the 1993–94 financial year. Compass also reported some sensitivity analysis in the Prospectus on a number of critical variables such as load factors, fares and fuel prices to test the impact of changes in these variables on profitability. It found that, in order to break even, the key variables would have to be worse than expected by the following amounts:

- average passenger load factor would have to decrease from 60 per cent to 41 per cent; or,
- average air fares would have to equal 50 per cent of current economy fares; or,
- fuel costs would have to increase by more than 400 per cent.

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1. The airline may have felt, however, that some of the facilities with which it was provided left something to be desired.

Comparison of actual events with Prospectus forecasts

Compass commenced operations on 1 December 1990 with two Airbus A300-600R aircraft. Delays to the delivery of a third and fourth aircraft led Compass to acquire aircraft on short-term leases from alternative sources. Operations were expanded some months behind schedule with a third aircraft on 1 April and a fourth on 15 July. The late delivery of aircraft delayed revenue generation required to offset a cost structure geared to a five-aircraft fleet. In September Compass commenced services with a fifth aircraft, two years ahead of the original schedule. Compass was planning to take delivery of a sixth aircraft in March 1992 (more than originally planned) and was considering a seventh, when it collapsed in December 1991.

Compass also deviated from the route network outlined in the Prospectus often at short notice. In the third week of operations, midday Sydney–Melbourne flights were axed and flights were added from the east coast to Perth. Initially, management had not intended to introduce east coast – west coast operations until after the airline's first year, but, perhaps in response to the initially low load factors on the Sydney–Melbourne route, the strategy was changed. In April, Compass put services to Coolangatta on the back burner and brought forward a planned move to Adelaide. In late 1991, Hobart and Alice Springs were being considered as possible destinations.

Compass' actual pricing strategies were quite different from the simple strategy outlined in the Prospectus. At the outset, Compass offered the fares as described in the Prospectus, plus 3- to 9-month advance purchase fares at discounts of up to 45 per cent off competitors' standard economy fares. By January, Compass was offering stand-bys at 50 per cent off; in May came sales of seats for any time in the next twelve months at 70 per cent off; in July came discounts for business travellers and by October, despite Bryan Grey's suggestions that customers get in early to beat the price rise, there were signs that the travelling public's expectations were becoming conditioned to continuing discounts. By this stage, any temporary halts to the discount war would have resulted in a cessation of demand, as potential travellers waited for an airline to crack and recommence discounting.

The changes from the original pricing strategy could have been partly the result of the pricing initiatives of the incumbents. Compass, perhaps somewhat short-sightedly, had not expected any response from competitors and found itself caught in a discounting war when Australian and Ansett continued to match its offers. It should be highlighted that the Trade Practices Commission (1992) concluded that, as Compass initiated the discounting in most cases, there was no evidence of predatory pricing on the part of the incumbents.

Compass Mk1 ceased operations on 20 December 1991, with an estimated deficiency of assets to meet liabilities of $45 million on a going concern basis

($171 million on a ceased business basis), and the company was placed in the hands of Ferrier Hodgson & Co. as provisional liquidators (Ferrier Hodgson & Co. 1992).

Causes of Compass Mk1's collapse

The Trade Practices Commission's report provides a thorough analysis of the collapse of Compass. It discusses a range of factors that might have contributed to the airline's eventual collapse. What follows below is a brief summary of what those contributing factors were.

In its external environment, Compass was faced in late 1989 and early 1990 with a boom in the world market for aeroplanes — leading to it paying top dollar for leasing of aircraft. Soon after Compass commenced of operations, however, Australia went into an economic recession which cut back the spending power of potential travellers and hence the size of the domestic passenger aviation market at any given level of prices and service quality. This meant that Australia's airlines had to cut fares simply to maintain passenger numbers and even more deeply in order to attract the record number of passengers which were carried.

In addition Compass was subject to a number of severe start-up obstacles, not entirely under its control, such as late delivery of aircraft and the failure of its telephone reservation system to cope with demand.

Access to appropriate terminal facilities has been identified as a barrier to entry (see previous chapter). The Trade Practices Commission concluded that while access to terminal facilities was not the only, or the most important factor in the collapse of Compass, the existing terminal arrangements did confer a market advantage on the incumbent airlines over new entrants.

Overall, however, the strategies which Compass adopted from the outset of its entry to the market and in the marketing of its services appear to have been the most significant contributing factors to its demise. If this was the case, then Compass may not have survived even if other conditions had been favourable.

From the outset, Compass was undercapitalised, despite the company raising $15 million in oversubscriptions. This was partly the result of unforeseen start-up costs. For example, before operations began Compass was told by lessors that it would have to hold approximately $30 million in security, which was double the original estimate. As a result, Compass was faced with a liquidity crisis as early as May 1991 (Trade Practices Commission 1992) which, combined with trading losses and the need to satisfy debts before the end of the financial year, could well have triggered Compass' introduction of the 'Recession Buster' fares, the first of the deep discounts.

A second factor contributing to its collapse was that Compass chose to compete head-on with the incumbent airlines — offering large expansions to capacity on the major routes. Compass appeared, however, to underestimate its relative disadvantage in competing for passengers, particularly full fare passengers. Because of its large planes, Compass was not offering improvements in service frequency commensurate with the number of seats it had available. Many business travellers found Compass flight times inconvenient. In addition, the incumbent airlines had established airline clubs (Golden Wing and Flight Deck) and offered a wider network of routes.

Finally, Compass appeared to operate on the presumption that the incumbent airlines would not be willing or able to match their discount prices and that it could unilaterally offer discounts to improve cash flow and then revert to higher prices. It couldn't: both Ansett and Australian matched Compass discounts and, once offered, there are severe difficulties facing airlines wishing to ratchet prices back upwards. They would face immediate penalties in terms of loss of market share and load factors and, in the longer term, improve their competitors' reputations as value-for-money airlines.

COMPASS MK2

Compass Mk2 commenced operations on 31 August 1992 and collapsed on 12 March 1993. The major causes of the airline's difficulties were lower than anticipated yields and higher than anticipated start-up costs, leading to a critical liquidity crisis.

Background to Compass Mk2

Management of Southern Cross Airlines (SCA) had been planning the airline's entry into the domestic aviation market for approximately two years when Compass Airlines Mk1 suspended flying operations in December 1991. Following the failure of Compass Mk1, SCA decided to acquire the collapsed airline and take advantage of the public support, market position, employee base and infrastructure developed by Compass Airlines Mk1 during its 12 months of operation. The operating strategy to be used by the new airline was to be that developed by SCA, and not based on the original Compass.

Funding and cash reserves

Management of SCA always had intended to raise the funds necessary to capitalise the airline through a public float. Following the decision to acquire Compass Mk1, management announced that they planned to raise $50 million through the public float of 100 million shares. This was actually $10 million less than the SCA's original target due to the expected cost savings resulting from the purchase of an established airline in liquidation.

Despite industry analysts supporting the operating strategy announced in the airline's Prospectus, the enthusiasm with which people invested in Compass Airlines Mk1 was not repeated in the float of SCA Holdings and the float was only 54 per cent subscribed. SCA Holdings, however, was underwritten by JB Were and Son and had a $10 million sub-underwriting agreement with the Queensland Government, who hoped to see a continuation in the growth in tourism which had resulted from Compass Mk1.

Although the float had not been as successful as that of Compass Mk1, management stated it was pleased that Compass Mk2 could commence operations with approximately $34 million in reserve. This was compared with Compass Mk1 which was undercapitalised from the start, as discussed in chapter 4. Management of Compass Mk2 estimated that, with over $30 million in reserves, the airline could withstand between 15 and 18 months of low fare competition, adjusting its fares if necessary.

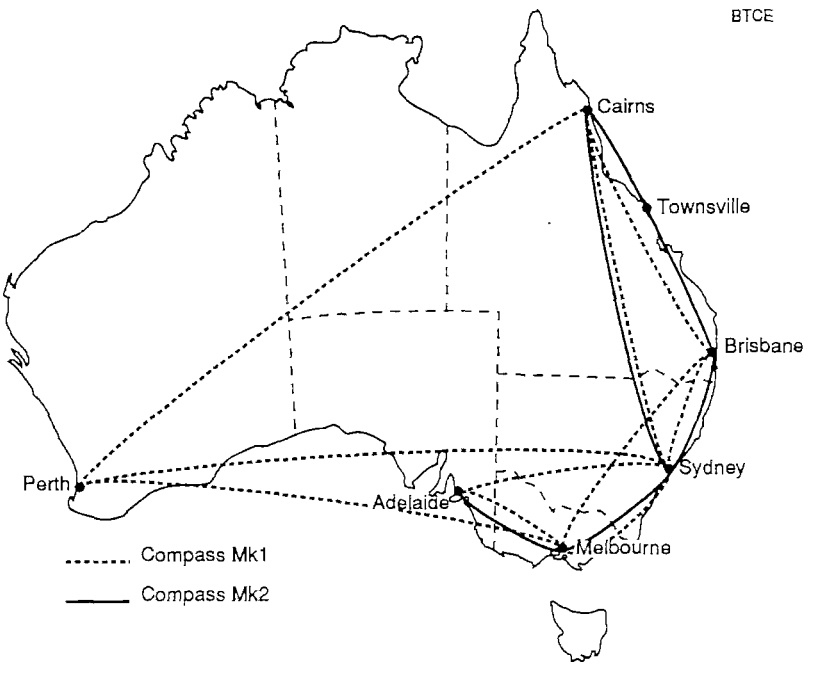
Operating details

Southern Cross Airlines Holdings commenced operations on 31 August 1992 under the name of Compass Airlines. The airline serviced the major eastern ports from Cairns to Adelaide[2] using a fleet of five McDonnell Douglas MD80 Series aircraft. It had plans to increase this to seven in early 1993. These aircraft were almost half the size of the Airbuses used by Compass Mk1 (142 seats compared to 280 seats). Not only were as few as 85 passengers required for the airline to cover costs, but management were spending approximately $40 million less on leasing costs than Compass Mk1.

Compass Mk2 offered an east coast major route network — taking advantage of the nearly linear network structure of its destinations to connect the maximum number of city pairs with the limited number of aircraft it had available. This was in contrast to Compass Mk1, which also offered services between Perth and Sydney, and Melbourne and Cairns, as shown in figure 5.1. One of the disadvantages associated with this network was that it meant an increase in the number of stopovers for many passengers, whereas direct flights were available from other airlines.

The original flight schedule developed by Compass Mk2 was quite demanding, with the airline operating 11 round trips a day between Sydney and Melbourne, six between Brisbane and Sydney, four between Adelaide and Melbourne, one linking Brisbane, Townsville and Cairns, and two round trips a day between Sydney and Cairns. In order to meet the schedule outlined in the Prospectus the annual aircraft utilisation was 4000 hours per aircraft. This level of utilisation was considered high in Australia. However, both McDonnell

2. Adelaide, Brisbane, Cairns, Melbourne, Sydney and Townsville.



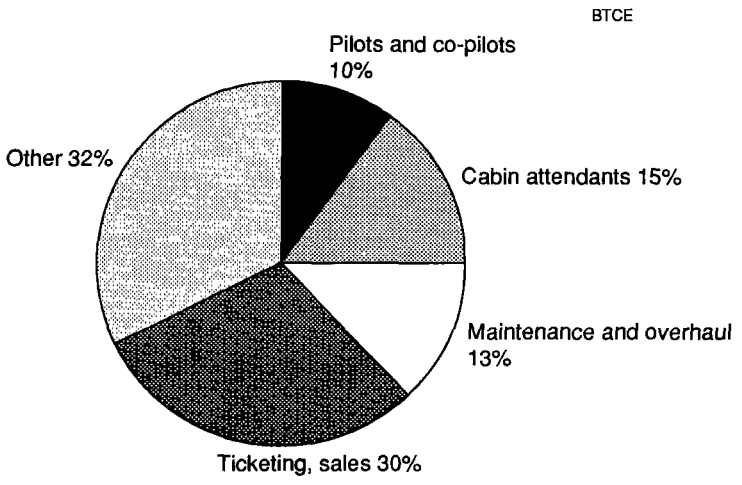
Sources Compass timetables.

Figure 5.1 Compass routes

Douglas and Airline Economics Inc. believed this level of utilisation to be feasible (Southern Cross Airlines Holdings 1992).

On commencing operations there were, however, some problems with this flight schedule in that it provided little scope for making up time lost on any one flight. (This appears, with hindsight, an impediment which should have been foreseen.) As a result, management revised the timetable to allow for aircraft to get back on schedule after a disruption, such as the ones that were frequently occurring at Sydney, in order to avoid gaining a reputation for late departures. These alterations reduced the annual aircraft utilisation level to approximately 3800 hours per aircraft, which resulted in the aircraft being used at less than their maximum capability.

The new Compass is estimated to have had a somewhat higher proportion of pilots than the other domestic major airlines, about the same proportion of cabin crew, slightly less maintenance staff and a higher proportion of ticketing and sales staff (figure 5.2). Compass had originally intended to contract out major maintenance tasks in order to reduce maintenance staff. However, it failed, and this worsened Compass' liquidity position. The airline was also forced to employ baggage handlers direct rather than use the services of American Airlines.



Source Table 3.1.

Figure 5.2 Compass Mk2: proportion of employees in each category

The role model on which Compass Mk2 was based was Southwest Airlines, a point-to-point, short-haul United States airline using only one aircraft type, which prides itself on consistently low fares and quick turnaround times. The Dallas-based airline has maintained its position as a niche operator and has developed a strong service reputation among passengers. As a result, in 1991 it was the market-share leader in 39 of its 50 top markets. Southwest has been consistently profitable when almost all other United States airlines have been flying on red ink. Sam Coats, Chief Executive Officer of SCA Holdings, was a vice-president at Southwest between 1982 and 1984, which might explain the use of Southwest as a model.

Management of Compass Mk2 claimed to have adopted a cautious approach to operating in the domestic market. Forecast profit levels included in the Prospectus were based on relatively conservative estimates of load factors, market share and annual average growth rates for the industry.[3] Management estimated in a supplementary prospectus that Compass Mk2 would make an initial loss of $7.75 million after tax, but by the 1993–94 financial year a $12.19 million profit would be made and this would increase to $16.76 million the next financial year. At the same stage, Compass Mk1 estimated a net operating profit of $18.8 million after its first year and $62.6 million the

3. 62 per cent, 5.7 per cent and 4.7 per cent respectively for the first year, where annual growth rate was averaged over a ten-year period.

following year. A sensitivity analysis included in the Prospectus showed that profit and liquidity was quite sensitive to changes in the basic assumptions.

Management claimed that after four months in the market the airline was achieving load factors of between 50 and 60 per cent, and that yields for October were higher than had been anticipated. Compass reported that these load factors were marginally ahead of budget (around 60 per cent).[4] The lack of available data on the passenger mix made it impossible to estimate whether or not the new airline was covering operating costs. However, load factors and/or prices might have been higher but for the entry of Qantas onto the domestic market in November 1992.

Fares

The airline offered a two-class service — Compass (economy) Class and Executive Class — with a simple fare structure and a limited number of discounts available. Initially, standard fares were between 30 to 40 per cent below the incumbents' economy fares and Compass' business fare was approximately 20 per cent less than the incumbents' standard economy fare. The most competitive fare in the Prospectus, a 14-day advance purchase fare of $59 one way Sydney to Melbourne, was not available when the airline commenced operations. A major contrast with the Compass Mk1 experience was the difference in signalling behaviour regarding price competition. Compass Mk1 was an aggressive price leader and the incumbent airlines, at least initially, found themselves matching the discounts offered by Compass. Later in 1991, all the airlines took the initiative at some stage in offering new discounts. Compass Mk2, by contrast, started flying with its cheapest discount fares above those of the opposition — $200 Sydney–Melbourne return, for example, when Ansett and Australian prices were as low as $169. Although the incumbents then raised their deepest discount prices somewhat, Compass discount fares stayed slightly higher (about 6 per cent) than the incumbents' for some time and were combined with verbal signalling that Compass did not intend to indulge in mutually destructive discount price wars. It would appear that Compass was attempting to ratchet prices back up. However, Compass may have been penalised in this attempt. Discount passengers are known to be price sensitive and there was no demand pressure on seat availability, so an airline attempting to lead prices upwards could expect to suffer a severe loss of market share. Compass matched prices with competitors from early 1993.

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4. Southern Cross Airlines Announce Half Yearly Results, press release, 23 February 1993.

Targeting business travellers

Compass Mk2 made a greater effort than its namesake to attract the high yield business travellers. Twenty of the 142 seats available on the MD80 aircraft were dedicated to Executive Class travellers. With the Executive Class fare some 20 per cent less than the incumbents' standard economy fare, management believed that Compass Mk2 would attract those business travellers looking for value for money rather than 'costly luxury' (Southern Cross Holdings 1992). In September 1992, Compass Mk2 introduced their Corporate Appreciation Program in response to the frequent flyer programs offered by Ansett and Australian Airlines, but it mainly targeted travellers making only a few return trips a year and who were discouraged from joining the rival schemes because of the high entry fees associated with them. In December 1992, Compass opened executive lounges at its main airports in an attempt to compete with the Golden Wing and Flight Deck lounges of Ansett and Australian.[5] According to the airline, Compass' Executive Class offered the business traveller competitive services, both on the ground and in the air, at an unrestricted fare which was significantly lower than what was previously available. However, flight frequencies and network coverage were still less than those of the incumbents and business clients may also have had doubts about the airline's long-term viability.

Although this was not a factor mentioned in the start-up phase, Sam Coats was reported as saying by the time of Compass' interim report in February that people associated the airline with Compass Mk1 and cheap fares. Compass therefore was having difficulty in attracting high yield business travellers prepared to pay either business class fares or full economy, even though its full fares were about 35 per cent lower than the incumbent airlines, Ansett and Australian.[6] This appears to have been the fundamental weakness in Compass' strategy — the definition of its market niche.

By the time of Compass Mk2's interim report to its shareholders in February 1993, however, Coats was reported as saying that Compass desperately needed to increase its share of the business class market, which offered much higher yields than economy class.[7]

Failure of Compass Mk2

Southern Cross Airlines Holdings Ltd was placed into voluntary receivership on Thursday 4 March, 1993 after only six months of operation. Richard Barber of Price Waterhouse was appointed receiver/manager and attempted to trade

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5. 'Compass cuts into business travel market', *Adelaide Advertiser*, 3 December 1992, p.35.
6. 'Coats the ghost at the feast', *Sydney Morning Herald*, 6 March 1993, p.34.
7. 'Compass hurt by ticket lies: Coats', *Courier Mail*, 2 March 1993, p.28.

the company out of difficulties, but this failed and Compass ceased operations on Friday 12 March. The main immediate issue was whether the company could get access to sufficient credit to continue operations. In the longer term Compass needed about $20 million in credit or cash to enable it to acquire the sixth and seventh aircraft of the fleet which it regarded as necessary to establishing a viable airline operation.

Precipitating factors to receivership

The factors which precipitated the company into liquidation were:

- A liquidity crisis brought on by a failure to draw on loans of $9.2 million arranged since 2 February with Decer Investments Pty Ltd, a company associated with Southern Cross deputy chairman Douglas Reid, or to find alternative sources of finance. This was the culmination of a problem that developed as a result of factors listed below.
- Compass was able to draw on only $2.5 million in loans whereas it had planned to have $16.5 million in credit facilities.
- This failure to get access to credit may have been related to Compass' $10.95 million interim loss in four months of operations announced on 23 February. The interim loss was some $3.4 million higher than the loss anticipated in the Prospectus for the first full year of operations.
- The failure to get access to credit also appeared to be related to the failure of Compass Mk1, in that normal credit lines were unavailable to the restarted airline. This led to extra start-up costs unforeseen in the Prospectus, including $10 million for purchase of parts and $10 million for purchase of engines and airframe spares which the company had planned to acquire through hire purchase financing.
- Other start-up costs which were not foreseen by the company in the Prospectus included an extra $3 million above Prospectus for the provision of airport ground handling and support services. Originally Compass planned to employ the services of an American Airlines owned company, but this arrangement was vetoed by the Transport Workers Union.
- The above factors led to an unexpected drain on cash reserves of about $26 million above anticipated start-up costs of $26.9 million.
- Thus at 30 December the company had cash reserves of only $4.3 million, and by the time of entering receivership it reportedly had a cash balance of $3.6 million but a deficiency of current assets over current liabilities of $7.7 million, and was unable to pay debts as they fell due.[8]

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8. 'Compass crash casts light on the board', *Courier Mail*, 13 March 1993, p.29.

There are possible legal issues arising from the company's failure. Douglas Reid, founder and deputy chairman, has been charged with knowingly supplying false information to the other directors. Receiver/manager Mr Barber is reported as saying that $10 million of the company's assets, purportedly being for security deposits for aircraft leases, 'appear to be a sham'.[9]

Comparison with failure of Compass Mk1

The situation appeared to be different from that surrounding the failure of Compass Mk1, in that, this time, the airline had not attempted to generate cash flow through a discount seat sell-off. On the other hand there were similarities with the previous experience in so far as Compass' underestimation of start-up costs had had a debilitating effect on company liquidity. Other similarities were the company's inability to attract a higher share of the higher paying customers away from the incumbent airlines, and a general overestimation of the opportunities to generate reasonable yields. The reasons for these difficulties are amplified by reference to the discussion on barriers to entry in the previous chapter.

Reasons for operating losses

Although there was a cash drain, it appeared on the limited information available that Compass operating costs were in line with Prospectus forecasts. Some items — aircraft leasing costs and Civil Aviation Authority charges — were reportedly cheaper than forecast, but others, for example, fuel costs, were more expensive. In contrast to Compass Mk1, which reportedly had to pay top dollar for its fleet of Airbus A300's in expansive 1990, Compass Mk2 reportedly paid 'a nice price' for its McDonnell Douglas MD80's in depressed 1992. The lease cost was quoted as 'under the $277 000 per plane per month forecast in the prospectus'.[10] As indicated above, the higher than anticipated cash requirements were due to a necessity to purchase parts and spares for cash rather than on hire-purchase, a failure of the company to arrange favourable credit facilities and an inability to contract out ground handling arrangements.

The major difficulty in the way of achieving profitability in the longer term appeared to be lower than anticipated yields. The apparently low yields appeared in turn to be caused largely by an inability to get a high-paying mix of passengers.

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9. 'Compass management remiss', *Australian*, 12 March 1993, p.32.
10. 'Compass brings forward plane delivery', *Daily Commercial News*, 26 November 1992.

Compass load factors were reportedly in line with those anticipated in the Prospectus, but on-time performance in the start-up phase was poor, and aircraft utilisation was less than expected because the airline was unable to achieve hoped-for turnaround times at Sydney airport. Thus flight frequency was reduced when it became apparent that delays at Sydney would continually interfere with the airline's schedule. The below-Prospectus performance inhibited the company's ability to spread its overheads and thus also had some contribution to reduced yields.

EASTWEST AND ITS RELATIONSHIP WITH ANSETT

Eastwest Airlines was formed in 1947 and in June 1992 the company celebrated its 45th birthday.

Eastwest has undergone a number of changes in strategy under various owners and different regulatory environments. During the early 1980s it was positioned in the market as a significant regional airline operating over 28 routes connecting State capital cities with a number of large regional towns, It was also able to partially circumvent the two airlines policy and offered some pinprick competition to the two major airlines through 'touch and go' landings at Albury, enabling it to connect Sydney and Melbourne and thereby get around the regulatory restrictions on interstate routes then prevailing. Similarly, it flew Adelaide–Melbourne via Mount Gambier and Brisbane–Sydney via Coolangatta and Newcastle. It had a small fleet of F27 turboprops and F28 jets.

Following the purchase of Eastwest by TNT/News Corporation in 1987, the company changed its strategy to play a complementary role to that of Ansett. The company's new strategy was to position itself as Australia's number one holiday and leisure airline with one-class, value-for-money services and a simple discount fare structure. There was considerable emphasis on providing frequency, convenient connections and non-stop services to popular leisure destinations. Eastwest's planned market niche was with people paying for their own tickets as distinct from business travellers. It acquired a new fleet of eight BAe146 jets, the F27's were sold or junked and the F28's were transferred to Ansett Express.[11]

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11. Eastwest's search for a market niche has continued up to the time of this publication, with its withdrawal from a number of routes and entry into new ones. For example, in 1988 Eastwest connected Adelaide, Albury, Armidale, Alice Springs, Brisbane, Cairns, Canberra, Caloundra, Coolangatta, Devonport, Hobart, Maroochydore, Melbourne, Noosa, Norfolk Island, Port Macquarie, Sydney and Tamworth. In 1992 Eastwest linked Brisbane, Cairns, Gold Coast, Hamilton Island, Hobart, Melbourne, Proserpine, Maroochydore and Sydney.

The search for a niche has not so far been entirely successful. The company retained about five per cent of the market before and after deregulation but was operating with load factors consistently lower than the major airlines. In the June quarter of 1992 its load factor was down to 63 per cent. Its estimated passenger revenues of $170 million in 1991–92 (Findlay 1992) translated into a relatively high revenue per passenger-kilometre of about 18 cents, but it was also a high cost airline with an operating cost per passenger-kilometre of over 21 cents. In 1992–93 Eastwest is in the profoundly uncomfortable position of expecting to make a loss for the fourth year in succession.

Drastic measures have been undertaken to reduce costs. In September 1991, Eastwest announced plans to close its maintenance base at Tamworth and to have Ansett carry out all its maintenance requirements. Around 230 staff were to be retrenched, although half the affected employees were expected to be placed with Ansett.[12] This cut the Eastwest work force by about one-third to about 520. On 7 May 1992, Eastwest announced that 140 jobs would be lost after a decision to amalgamate administrative activities (including accounting), sales functions and air crew management with Ansett.[13] In July Eastwest closed its flight attendant branch in Brisbane and centralised crew operations in Sydney.

From January 1992, Eastwest leased a larger B727 from Ansett and leased back a BAe146 to Ansett for use in New Zealand. A second B727 followed in May 1992 but Eastwest was 'sharing' the aircraft with Ansett, Eastwest getting middays and weekend usage. In February 1993, four of the five directors of Eastwest handed in their resignation, leaving control of its previously independent board in the hands of its two major shareholders, News Corp Ltd and TNT Ltd.[14]

POTENTIAL ENTRANTS

When applications were called for in February 1990 from interested carriers to take up domestic terminal facilities to be provided by Australian and Ansett at Sydney, Melbourne, Adelaide, Perth, Coolangatta and Launceston, a total of 11 applications were received. Two of these airlines were AAA Airlines and Transcontinental Airlines. What follows is a brief examination of the operating strategies that these airlines intended to adopt.

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12. By 24 December 1991, only 40 per cent of 220 staff retrenched by Eastwest had taken up jobs elsewhere with the airline or with Ansett. Activities at the maintenance base in Tamworth were wound up on 31 January 1992 and the base put up for sale in July 1992.
13. A reduction of staff at Eastwest from 550 to 410 — although half the staff losing jobs were expected to be redeployed with Ansett.
14. 'Eastwest directors to leave the flight deck', *Financial Review*, 19 February 1993, p.21.

The failure of both these airlines to get even close to operating is another demonstration of the difficulty and complexity in establishing a viable airline operation. Clearly entry is not costless and the market is not purely contestable. Moreover, the fact that deregulation of the sector has occurred does not by itself guarantee success in the absence of adequate finance, sound management practices and other measures needed to ensure long-term viability in the aviation sector.

AAA Airlines

AAA Airlines' plan was to operate a fleet of three McDonnell Douglas DC9-30 aircraft on 120 services on weekdays between Sydney and Melbourne. On weekends and public holidays two of the aircraft would be chartered out. The company intended to put 12 600 economy seats into the Melbourne–Sydney market each week, an increase of approximately 14 per cent on the capacity on that route based on October 1991 passenger data.

The company expected to raise 70 per cent of its capital from pilots and 30 per cent from a group of Sydney investors, and planned to take delivery of its first aircraft on 29 November 1991. Despite initial plans to raise $30 million, only $1.5 million was eventually raised, mainly from a number of pilots hoping to secure jobs with the new airline. In late December 1991, AAA announced that it would start shuttle services between Sydney, Melbourne and Brisbane before April 1992 but conceded that it did not yet have an air operator's certificate.

In early February 1992 the Australian Securities Commission began an examination of AAA Airlines after being informed that the company had a cash flow problem and had stopped all salary payments to staff until it could negotiate $2 million in short-term financing. On 25 March 1992 the Supreme Court appointed a provisional liquidator to the company on the application of Mr Marc De Stoop, AAA Airlines' main investor and Director. In May 1991 it was reported that AAA had lost or owed somewhere between $3 million and $4 million: $750 000 to trade creditors, $1.5 million to the pilots and around $1.5 million to Mr De Stoop and others who had invested in the company. The Supreme Court twice deferred proceedings to allow the company to continue to search for funding to establish a viable airline, before it was wound up late in 1992.

Transcontinental Airlines

In April 1990 Transcontinental Airlines announced that it had secured financing and that it was leasing 12 B737-300 aircraft, which were expected to begin arriving in August that year with staff recruiting expected to commence in mid year. The company was to be based in Melbourne.

The company applied for terminal access in Sydney, Melbourne, Perth, Adelaide, Coolangatta and Launceston. It received second ranking in the competition for terminal access after Compass and had to negotiate with Ansett for terminal access.

TransCon proposed to offer a two-class service, business and economy, and expected about half of its passengers to be business travellers. In September 1990 it announced that it proposed to commence operating in March 1991 but was having difficulty negotiating with Ansett for satisfactory terminal space.

In January 1991, citing problems with terminal access, leasing of aircraft and obtaining approval from the Civil Aviation Authority, TransCon announced that it was deferring start-up until October or November 1991. The economic climate was also nominated in support of the decision.

There have been rumours that TransCon still plans to commence operations, beginning in Western Australia and expanding to a service between Adelaide, Darwin and Perth before attempting to compete on the eastern seaboard. The timing of TransCon's entry into the market, however, has not been reported.

QANTAS TAKEOVER OF AUSTRALIAN

Qantas acquired Australian Airlines from the Federal Government for $400 million on 14 September 1992. This action allowed Qantas, with 27 000 staff, a 120 aircraft fleet and revenues of $5.7 billion per annum to jump five places to number 15 in world airline ranking in terms of revenue, and to 21st in ranking for passengers carried.

In taking over Australian, Qantas has announced its intention to build a seamless domestic and international airline service. This would provide, for the first time, convenient physical and timely connections between domestic and international services for both inbound and outbound international travellers. Considerable investment and planning are required to achieve this vision at airports such as Sydney's Kingsford-Smith Airport, given the present physical separation of the international and domestic terminals. Ansett's intentions to offer connections to New Zealand and Southeast Asia from its existing terminals have added to the need to address the issue of facilitation.

The most important expected effect of the takeover is the marketing advantage which it will confer on Qantas if it can provide a 'seamless' service and 'operational synergies' through improved flight frequencies, schedules and seat availability, through access to a larger fleet.

Qantas commissioned a review by Coopers & Lybrand to identify savings opportunities as a result of the takeover. The review identified annual savings of $158 million — $95 million as a result of staff reductions, and $63 million

elsewhere.[15] This represents a saving of nearly three per cent on the combined costs of the two airlines in 1991–92 and therefore indicates significant scope for improvement in productivity and profitability. The Coopers & Lybrand review recommended a reduction in staff numbers of 1835. A reduction of around 1000 staff is expected to have been achieved by mid 1993,[16] and while more are expected to occur in later periods it is likely that the figure of 1835 will be reduced somewhat before the staff rationalisation process is complete.

The savings identified by Coopers & Lybrand, many of them from pruning duplicated functions in the two organisations, raises the question whether this is evidence of Qantas gaining from economies of size or scope. There was no evidence in the literature (as discussed in chapter 4) that an airline of Qantas' size can achieve any cost reductions from becoming a larger airline. Moreover, there should be no gains achievable from economies of density, as the two airlines operated largely on different routes and the merged airline's traffic density would be approximately the average of the two entities. The merger may have had an indirect effect however, in providing an opportunity to target areas of low productivity. A thorough investigation of this question would require the benchmarking of Qantas against a fully efficient airline with similar operating characteristics.

On 2 October 1992, Qantas/Australian announced a combined frequent flyer program giving members of the former Australian Airlines and Qantas programs the ability to accumulate points for free travel by flying to any one of Qantas, Australia Asia, Australian Airlines or Australian's regional subsidiary airline services. Points were also accumulated for stays at 88 participating hotels, use of Hertz/Avis car rentals and stays on Australian's Queensland island resorts.

Reports indicated that Qantas was moving to integrate its terminal operations with Australian. The current physical separation of the domestic and international terminals at Sydney's Kingsford-Smith Airport and at Brisbane can be an important time waster for some travellers. At the same time however, the physical layout of Kingsford-Smith, closer access to Sydney's central business district from the north side of the airport and plans for a third runway make these moves problematic.

As of 1 November 1992, Qantas was authorised to carry domestic traffic through the sale of spare capacity on domestic sectors of international services.

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15. 'Report calls for big Qantas job cut', *Financial Review*, 19 January 1993, p.3. Given one-off implementation costs of about $65 million, the net annualised savings were claimed to exceed $70 million by the end of 1993.

16. 'Qantas-Australian staff facing retrenchments', *Australian*, 2 March 1993, p.8.

OTHER STRATEGIC ALLIANCES

Ansett, possibly influenced by the Qantas–Australian merger and frequent flyer program, announced in September 1992 a frequent flyer deal of reciprocal rights with international carriers British Airways, Cathay Pacific, All Nippon and United Airlines. The arrangement with British Airways has since had to be dissolved on account of British Airways taking a 25 per cent interest in Qantas. Ansett has since entered into an agreement with Singapore Airlines, including interchange of frequent flyer points and other commercial agreements with Lufthansa, Alitalia, Garuda and Malaysian Airlines.

At the regional level there are still a number of independent airlines of some significance, including Hazelton and Flight West. In October 1992, it was announced that New South Wales rural carrier, Oxley Airlines, was negotiating a closer formal affiliation with Ansett. This followed an earlier transference of commercial and operational allegiances by Hazelton Airlines from Ansett to Australian.[17] In March 1993, Hazelton announced a new passenger service agreement with Ansett and from 18 April relocated back to Ansett's Sydney terminal.[18]

17. *Aircraft*, October 1992, p.40.
18. Hazelton Airlines, letter to Senator the Hon. Bob Collins, 25 March 1993.

PART II: CONDUCT

CHAPTER 6 CHANGES IN DOMESTIC AIR FARES

When the decision to deregulate the Australian domestic aviation industry was announced in October 1987 it was hoped that the increased competition resulting from deregulation would encourage airlines to offer more and better discounts, thus stimulating demand and lowering the average cost of air fares to the travelling public (Evans 1987). Specifically, the government envisaged a number of key benefits resulting from the changes, one of which was 'a wider range of air fares, in particular an increased availability of discount fares' (Evans 1987, p.3).

Now, two years after deregulation, it is of interest to examine the changes that have occurred to air fares over this period. Investigating questions such as: 'What has been the effect of competition on the depth and availability of discount fares?', and 'What has happened to the real cost of average, full economy and premium fares?' will enable a number of conclusions to be made concerning whether the fare related consumer benefits envisaged by the government have been realised.

AVERAGE FARES

In an industry which offers consumers a wide range of fare types differing across routes and over time, data are not available to obtain a detailed picture of which fares and in what quantity were used for travel on any one route at any one time. For example, during heavy discounting in late 1991 a fare of $250 was available for return travel between Melbourne and Perth. Unfortunately information on the number of seats actually available at this price, on which days and for which flights is not publicly known, and hence the actual use of this and most other individual fares cannot be accurately determined.

However, there is a measure available that gives a broad indication of the prices that were actually paid for air travel. This measure is the average fare paid, comprising a weighted average of all fares sold, premium, full economy and discount. When viewed as a real index of change over time it reveals aggregate changes in the cost of air travel. The other use for this measure is

in deriving estimates of average airline revenues. The following section illustrates how average fares have changed over time.

Average fares prior to deregulation

From November 1981 through to 30 October 1990 passenger fares on all scheduled domestic air services were set by the Independent Air Fares Committee (IAFC). The IAFC was established to determine cost-based fares reflecting efficient and economic, and as far as possible for the national trunk network, competitive air services.

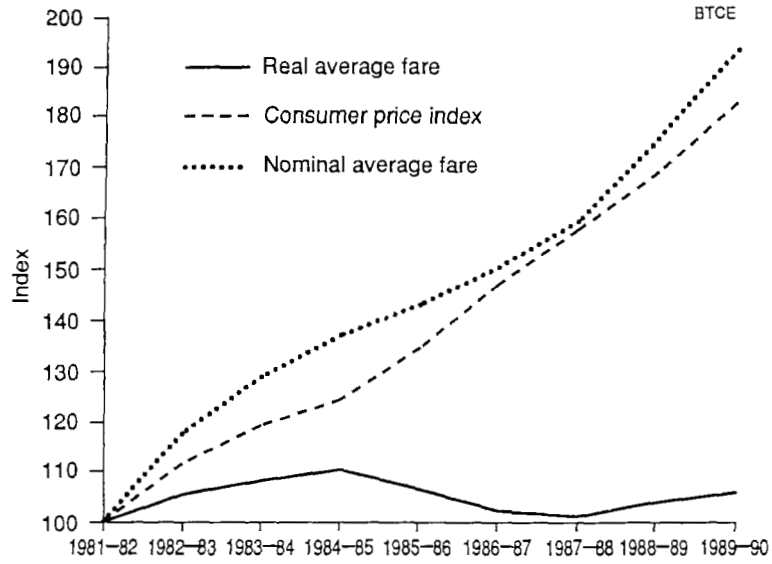
Economy fare determinations made by the IAFC were aimed at enabling an airline to generate sufficient revenue from its operations to cover its efficiently and economically incurred costs, including a provision for profit. Discount fare submissions were approved provided they met the simple criteria of being likely to improve the profitability of the operations of the applicant, unlikely to result in economy fare increases by any other trunk route operator, and were to be sold with reasonable and non-discriminatory conditions (IAFC 1990).

On a network-wide basis average fares during the nine years of the IAFC operations by and large tended to emulate movements in the consumer price index, deviating only in the early part of the 1980s when the industry was in a downturn and the airlines were committed to major re-equipment programs, and again in 1989–90 when special abnormal costs were incurred as a result of the pilots' dispute. Figure 6.1 illustrates in index form the real average passenger fare over the period 1981–82 to 1989–90.

Throughout the 1980s the average passenger fare remained at around 80 per cent of the full economy fare, indicating a relatively stable mix of premium, full economy and discount fare sales, and, despite price rises in the early 80s, ended the decade at only a little over 6 per cent higher in real terms than in 1981–82. This rise can in part be explained by an IAFC determination in January 1990 which allowed a 5 per cent fare increase for Ansett and Australian, as a partial offset of abnormal costs resulting from the 1989–90 pilots' dispute (IAFC 1990).

Average fares post-deregulation

To track movements in post-deregulation fares it is necessary to establish a pre-deregulation base against which subsequent developments in prices can be compared. This study uses quarterly data to track movements in air fares and considers the September quarter 1990 as the most appropriate period to use as a pre-deregulation base. An alternative would have been to use the December quarter 1990, given that deregulation occurred on 30 October and the new entrant, Compass Mk1, did not commence until 1 December — at this point flying only two aircraft. However, despite this small amount of activity,



Sources IAFC (1990), BTCE estimates.

Figure 6.1 Index of network-wide average fare

the Prices Surveillance Authority (PSA) found that average fares did fall both in nominal and real terms between the September and December quarters. It is therefore reasonable to assume that both actual competition during the month of December and the actions of the incumbent airlines in positioning for competition were sufficient to drive down average prices, and hence to treat December 1990 as a post-deregulation quarter for the purpose of monitoring changes in air fares.

Unlike the relative stability of pre-deregulation prices, average fares paid for post-deregulation travel[1] have exhibited far more volatile behaviour. Consecutive falls through the December quarter 1990 and the March quarter 1991 resulted in the average fare declining by over 10 per cent. Following further drops during the September and December quarters of 1991, in real terms the average fare was nearly 35 per cent lower than it had been just prior to deregulation. During 1992 two quarters of increase followed by two

1. In February 1991 the government directed the Prices Surveillance Authority (PSA) to monitor movements in the average fares paid by travellers on interstate air routes. The PSA fulfils this direction by collecting and analysing data for the nation's top 30 routes, reporting, inter alia, quarterly results in index form for an aggregate of average fares paid on the top 21 interstate routes. Traffic on these 21 routes accounts for 80 to 85 per cent of the total volume of domestic traffic, and accordingly findings for the PSA monitored routes can be considered a good proxy for activity on the domestic network.

quarters of stability saw the real average fare end the year at a level 20.7 per cent lower than it had been just prior to deregulation. Thus, in real terms over the two years since deregulation (September quarter 1990 to December quarter 1992) average fares paid for travel on Australia's domestic air network have fallen by around 20 per cent.

Table 6.1 illustrates the quarterly changes in the average fare paid since deregulation for travel on the 21 principal interstate air routes.

Consumer price index movements between the September quarter 1990 and the December quarter 1992 have been quite small, with a net increase of around 4 per cent, most of which occurred between the September and December quarters of 1990. The index of real change in average post-deregulation air fares is illustrated in figure 6.2.

While figure 6.2 illustrates significant variation in fares over time it should be noted that this is a weighted average for all routes monitored by the Prices Surveillance Authority. In fact, the variation in average fares paid on some individual routes has been substantially greater than that for the combined routes, and on other individual routes less so. For example, the Prices Surveillance Authority reported that between the September quarters of 1990 and 1991 all average fares monitored decreased. However, decreases were within a range of 3.1 per cent on the Canberra–Sydney route to 42.4 and 39.9 per cent on the Melbourne/Sydney–Perth routes (PSA 1992a, 1992b).

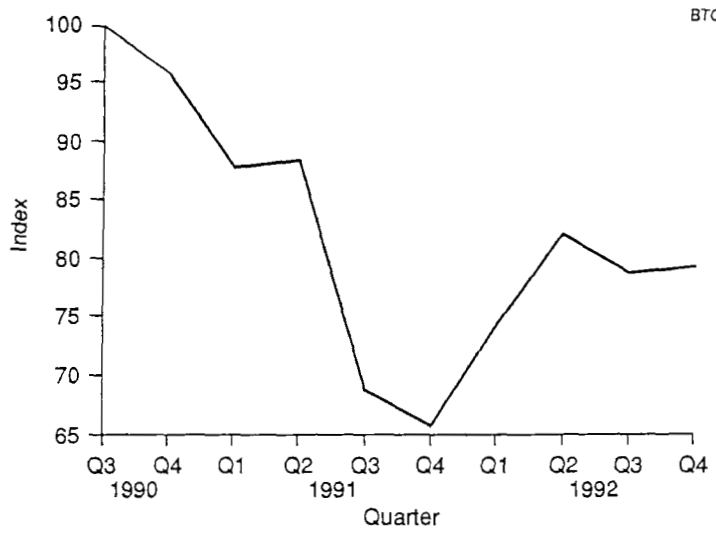
The most probable reason for the substantial variation in average fares paid between different routes is the impact of competition between Compass and the incumbent operators. This is why routes such as Sydney–Melbourne

TABLE 6.1 QUARTERLY MOVEMENTS IN AVERAGE AIR FARE PAID

Quarter	*Nominal variation from 1990Q3 (per cent)*	*Real variation from 1990Q3 (per cent)*	*Index of real change*
1990Q3			100
1990Q4	(1.7)	(4.2)	95.8
1991Q1	(10.1)	(12.2)	87.8
1991Q2	(9.3)	(11.6)	88.4
1991Q3	(29.1)	(31.3)	68.7
1991Q4	(31.6)	(34.4)	65.6
1992Q1	(22.5)	(25.6)	74.4
1992Q2	(14.7)	(17.9)	82.1
1992Q3	(18.1)	(21.2)	78.8
1992Q4	(17.2)	(20.7)	79.3

Note Numbers in brackets are negative

Source PSA (1993).



Source PSA (1993).

Figure 6.2 Index of real average air fare

experienced larger drops in average fare paid than Canberra–Sydney. An analysis of changing patterns of fares across time and different routes would be interesting. However, the data required are unavailable.

FULL ECONOMY AND PREMIUM FARES

Full economy fares

Reductions in average fares since deregulation both for the network and on individual routes illustrate that on an aggregate level many more travellers are now able to use discount fares. However, what has happened to the price of full economy air travel?

Despite the greater use of discount fares, the full economy can often be the cheapest fare available to business travellers who either make their flight booking at the last minute when all discounts are sold out or are unavailable due to pre-purchase time constraints, or who wish to retain full reticketing flexibility which can often be unobtainable under discount fare conditions.

As average fares have fallen post deregulation, by and large full economy fares have risen. Between the September quarter of 1990 and the December quarter of 1992, the nominal cost of a full economy fare (Ansett, Australian and Eastwest) on the top 20 domestic routes rose by between 12 and 28 per

cent, or 8 to 22 per cent in real terms. Compass Airlines Mk1 entered the market with a policy of selling full economy seats at approximately 80 per cent of the price charged by its incumbent competitors, and for some late-night services, 50 per cent. Comparisons of ticket price data for the period during which Compass Mk1 operated indicate this pricing policy was fairly closely adhered to. Thus maintenance of economy fares at the 80 and 50 per cent rate meant that as Ansett and Australian full economy fares rose in real terms, so did those of Compass. When Compass Mk2 entered the market it offered full economy fares that were significantly cheaper than those of Ansett and Australian. A survey of September 1992 prices indicated that Compass Mk2 full economy prices ranged between 47 and 64 per cent of the full economy fare charged by its competitors. Compass Mk2 also offered an 'off-peak' economy fare on some routes, priced $20 below its peak economy. The full economy fares of both Compass Mk1 and Mk2 are significant in that they offered to business travellers the advantages of last-minute purchase and reticketing flexibility at a price less than that of the incumbents.

To provide a basis for comparison of full economy fare movements with average fare movements, a weighted average full economy fare[2] based on the listed prices of Australian, Ansett and Eastwest was calculated for the top 20 domestic routes. It is assumed that given the volume of traffic captured by the top 20 routes (around 80 to 85 per cent of all traffic), cumulatively they provide a good proxy for the complete domestic network.

Between the September quarter of 1990 and the December quarter of 1992 this weighted average full economy fare increased nominally by 19 per cent, being a rise in real terms of 14 per cent. This represents a notable departure from the historical performance of airline average full economy fares which, under the guidance of the IAFC, tended to emulate CPI movements, with minor variations due to short-term extraneous factors. Notable also is the loss of the strong link to average fares displayed prior to deregulation — average fares during the 1980s were around 80 per cent of the average full economy

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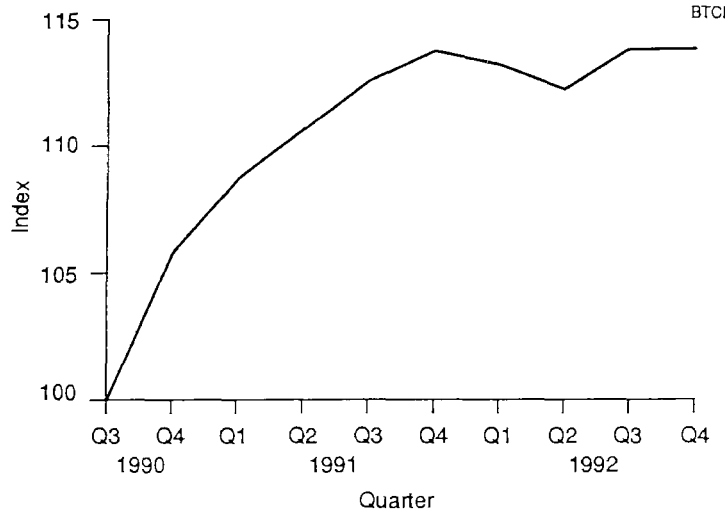
2. Quarterly weighted average full economy fares are calculated by the following method. Using monthly fare surveys for Ansett, Australian and Eastwest services on the top 20 domestic air routes, based on traffic-on-board by stage (TOBS) for 1990–91, a quarterly representative full economy fare is obtained for each route. These quarterly fares are then weighted by quarterly TOBS passenger numbers for each route, the products summed and then divided by the total TOBS for the top 20 routes to derive a quarterly average fare. An index is then calculated from these quarterly average fares using the September quarter 1990 as the base.

   Unfortunately it was not possible to include Compass full economy fares in this series as they were substantially different from those of the incumbents and there was no way of determining an appropriate weighting to allow them to contribute to a network average. When examining the full economy fares series it should be remembered that Compass fares were lower than those of the incumbents.



Sources DTC, BTCE estimates.

Figure 6.3 Index of real weighted average economy air fare (Australian, Ansett, Eastwest)

fare. The movement of the weighted average full economy fare for the top 20 routes (network proxy) is illustrated in figure 6.3.

Figure 6.3 reveals a fairly steady increase in the economy fare over the first five quarters of deregulation, peaking in the December quarter 1992 at a level 14 per cent higher in real terms than immediately prior to deregulation. Despite a couple of small changes, this level was then more or less maintained throughout 1992. Compass Mk1 full economy fares, while lower than those of the incumbent airlines, also followed this real growth trend during 1991. Compass Mk2 full economy fares did not change between the September and December quarters of 1992.

One possible reason for the rise in full economy fares can be found in the growing sophistication of airlines' management of yield. Broadly, the air travel market can be segmented into two categories, time sensitive business travellers requiring high flight frequencies and last-minute seat availability, and less time sensitive but more price sensitive leisure travellers (Tretheway 1991; Tretheway & Oum 1992).[3] By blocks of full fare economy seats on most flights being kept aside until the last moment before take-off, the business traveller is guaranteed a higher frequency of flights to choose from. If, through better

3. Refer to chapter 4 for a fuller discussion of airline economics.

yield management, more seats closer to departure time are now being kept aside for business travellers, this represents an improvement in service quality which may justify an increase in the price of the service. Of course, the potential cost to airlines of this improved service quality is that the seats held aside for business travellers may not be purchased and thus a discount revenue may have been forgone. Offsetting these potential costs could also be a reason for raising the unit price of full fare seats. Yet another reason for the price increase could simply be that business passengers have low price-elasticities and do not choose between airlines primarily on the basis of price. Thus airlines could have increased prices to extract some economic rents from this class of passenger.

The levelling off of the rise in full economy fares in 1992 could be attributed to a number of factors. The airlines may have finished adjusting prices by the end of 1991 to account for the costs of improving service quality, or alternatively, the rise in average fares following the exit of Compass Mk1 from the market may have diminished the pressure to extract rents from less price-elastic passengers.

Premium fares — first class

As with full economy fares, first class fares have undergone substantial price changes since deregulation. However, whereas full economy fares experienced a steady climb in real terms to a plateau in 1992, first class fares have changed value in three distinct phases.

The first phase was one of growth. Between the September quarters of 1990 and 1991 the weighted average first class fare for the top 20 domestic routes rose in real terms by 22 per cent.[4] Growth then essentially levelled off for the next two quarters, easing up by a further one per cent.

The second phase was one of major decline. On 23 March 1992, Australian Airlines ceased offering a distinct first class. The former first class was merged with business class to form a new 'premier' class and passengers paying the full economy fare were moved up to the new 'club' class (previously business). In response to the changes introduced by Australian, Ansett Airlines retained first, business and economy classes but reduced fares for first class to the former business class level and business class fares to the former economy fare. Australian Airlines reclassification ended on 17 June 1992 when first, business and economy classes were reintroduced (see box 6.1 for further detail).

4. Calculation method same as for full economy weighted average.

BOX 6.1 CHANGES IN AIRLINE FARE CLASS STRUCTURES

Domestic interstate airlines in Australia have generally operated three distinct fare class arrangements; first (premier), business (executive) and economy classes. Despite efforts from time to time to differentiate their fare class structures in attempts to gain market share, the major airlines have generally reverted to a mirroring of each other's arrangements.

In late 1982 the Independent Air Fares Committee set first class fares for both airlines at 50 per cent above the standard economy fare, and for business class the margin was set at 15 per cent. These margins were maintained until deregulation in October 1990.

No further changes in class structures of either airline took place until July 1989, when Ansett restyled its first class service to premier class and business class to executive class. In late October 1990, however, just prior to deregulation, Ansett reverted to its earlier arrangement, bringing it back into line again with Australian's.

During 1991 Ansett upgraded its first and business class seating by installing new first class seats at a cost of around $18 000 each and replacing their business class seats with the former first class seats.

In March 1992 Australian Airlines revised its class arrangements from first, business and economy to two classes of business travel, premier and club, while retaining an economy class. Premier class combined the former first and business classes, with the fare now being 25 per cent above the full on-demand economy fare but costing no more than the former business class with seating remaining two abreast. Club class replaced the former economy class and was reserved for passengers paying the full economy fare with seating remaining in a three-abreast configuration. Economy class was reserved for travellers holding discount tickets. These new arrangements reportedly cost Australian around $5 million in reconfiguring the airline fleet. The reasons for implementing the new arrangements were primarily response to a perception of changing trends in full fare traffic and the desire to create fare classes that were more attractive to the current group of full fare travellers. The decision was based on a number of factors including surveys that showed Australian's first class traffic had fallen over the previous two years from around 10 per cent of its overall sales to around 2 per cent.

In response to the changes introduced by Australian, Ansett Airlines reacted by announcing the retention of their first, business and economy classes but with a reduction in fares for first class to the former business class level and a reduction in the business class fare to the former economy fare. In addition, Ansett retained the two-abreast seating configuration for both first and business classes. This was in contrast to Australian's three-abreast seating for their club class.

In June 1992 Australian Airlines reverted to its original first, business and economy class levels on all flights, thereby once again mirroring Ansett's class levels. The revised arrangements for Australian meant that business class reverted to two-abreast seating on all aircraft. Although fare classes for both airlines reverted to their earlier arrangements, premiums above economy fares for first and business class fell to around 25 per cent and 10 per cent respectively for both airlines. Reasons given by Australian for the reversion were loss of market share to Ansett and market confusion identified by travel agents and commercial clients leading to a competitive disadvantage for the airline. A further reason given was the need to ensure compatibility with Qantas cabins thereby allowing a smooth flow of traffic between both airlines after they merged.

The result of this period of premium fare competition was a substantial reduction in both first class and business class fares. Between the March and June quarters of 1992 the average first class fare fell by 25 per cent. First class fares were now 7 per cent cheaper in real terms than immediately prior to deregulation.

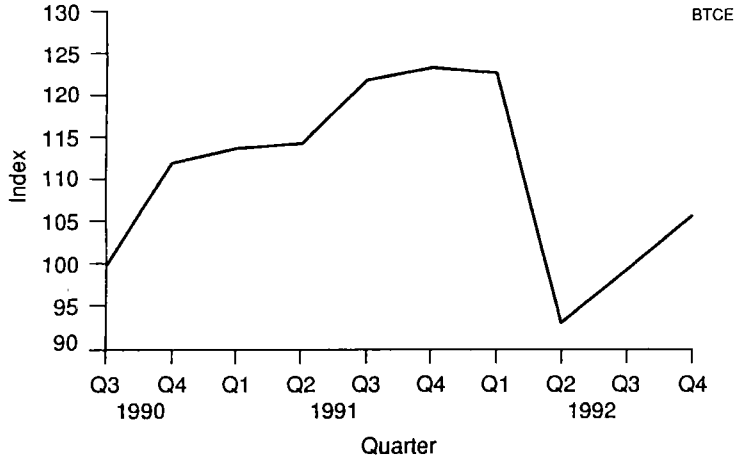
The third phase of change in first class fares was one of growth. Between the June and December quarters of 1992 the weighted average first class fare rose from a level 7 per cent lower than pre-deregulation prices to one 6 per cent higher in real terms.

The detailed movement of average first class fares following deregulation is illustrated in index form in figure 6.4.

It is of interest to note, that despite the significant reductions to premium fares in late March 1992, average fares paid for travel actually rose substantially between the March and June quarters of 1992. The contribution of lower premium fares, which on their own would have brought about a reduction in average fares, was offset by a reduction in the availability of discount fares and/or a decrease in the depth of discounting.

Premium fares — business class

The movement of business class fares since deregulation has exhibited a similar trend to first class fares.



Sources DTC, BTCE estimates.

Figure 6.4 Index of real weighted average first class air fare

Business class fares rose between the September quarters of 1990 and 1991 to a level 22 per cent greater in real terms than just prior to deregulation. A relatively flat period followed for the next two quarters.

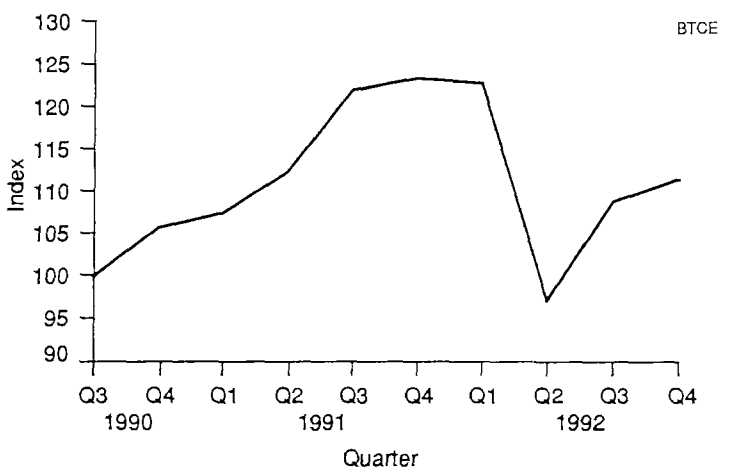
Resulting from the premium fare competition between Ansett and Australian mentioned above, the average business class fare fell by over 20 per cent between the March and June quarters of 1992. The average business class fare was now 3 per cent cheaper in real terms than in the quarter immediately prior to deregulation.

The final phase of change in business class fares, as with first class fares, was then one of growth. Between the June and December quarters of 1992 the weighted average business class fare rose from being 3 per cent lower than pre-deregulation prices to 12 per cent higher in real terms. The detailed movement of average business class fares following deregulation is illustrated in index form in figure 6.5.

Premium fares — margins above full economy class

Further to the real change in the cost of premium class air travel, it is also informative to look at the changing margins between premium and full economy fares.

In late 1982 the Independent Air Fares Committee set first class fares for both Ansett and Australian Airlines at a 50 per cent premium on standard economy fares while for business class a 15 per cent premium was established (IAFC



Sources DTC, BTCE estimates.

Figure 6.5 Index of real weighted average business class air fare

TABLE 6.2 FIRST AND BUSINESS CLASS FARE INDICES OF REAL CHANGE AND MARGINS ABOVE FULL ECONOMY FARE

	Average first class fare		*Average business class fare*	
Quarter	*Index of real change*	*Margin above economy fare (per cent)*	*Index of real change*	*Margin above economy fare (per cent)*
1990Q3	100	50	100	15
1990Q4	112	59	106	15
1991Q1	114	57	107	14
1991Q2	114	55	112	17
1991Q3	122	62	122	25
1991Q4	123	63	123	25
1992Q1	123	63	123	25
1992Q2	93	25	97	0
1992Q3	99	31	109	10
1992Q4	106	39	112	13

Source BTCE estimates.

1990). These margins were based on the Committee's assessment of the estimated cost of the benefits provided, such as increased seating space, as well as the additional costs in areas such as catering and exclusive facilities provided.

These margins were departed from quite markedly following deregulation. Despite real increases in full economy fares, the margins for both first and business class fares have increased since deregulation.[5] First class margins increased immediately, jumping from 50 to 59 per cent between the September and December quarters of 1990, and reached a high of 63 per cent by the March quarter 1992. Business class margins took off more sedately, remaining close to 15 per cent for the first three post-deregulation quarters, until jumping up to 25 per cent in the September quarter of 1992. The 25 per cent margin was maintained through to the March quarter 1992.

Following the substantial reduction in first and business class fares in the June quarter of 1992, the margin for first class fares dropped to 25 per cent, and the margin for business class fares to zero. However price rises during the September and December quarters of 1992 raised these margins to 39 per cent for first class fares and 13 per cent for business class fares. While these margins are still below those of pre-deregulation days it is important to recall that full economy fares have experienced real increases over this period and

5. Margins are based on comparing the weighted average first and business class fare for the top 20 domestic routes with the similarly weighted average full economy fare.

that first, business and full economy fares are all more expensive in real terms than they were before deregulation.

Changes in premium fare margins following deregulation are illustrated in table 6.2.

FARES ON MAJOR ROUTES

This section illustrates the comparative changes since deregulation in first, business, economy, deepest discount and average fare paid for three selected routes. The purpose is to provide a graphic illustration of the trends and route-specific differences in particular fare types and margins between fare classes that have occurred since deregulation.[6]

The three routes examined, Brisbane–Sydney, Sydney–Melbourne, and Melbourne–Perth, together account for around 35 per cent of all domestic traffic. Sydney–Melbourne is Australia's densest air route and is largely composed of time sensitive business travellers. Brisbane–Sydney is the second densest route carrying a high volume of business traffic as well as Queensland holiday travellers destined for either Brisbane or more northern ports. Melbourne–Perth carries a mix of business and leisure traffic but is only a fifth of the volume of Melbourne–Sydney, and, unlike the other two routes which lost Compass Mk1 in December 1991, was not serviced by Compass Mk2.

Fares for the three routes are illustrated in figures 6.6 to 6.8.

A number of common points emerge in figures 6.6 to 6.8. The first is the steady increase in real terms of both first and business class fares through to the March quarter 1992, followed by a substantial reduction in the June

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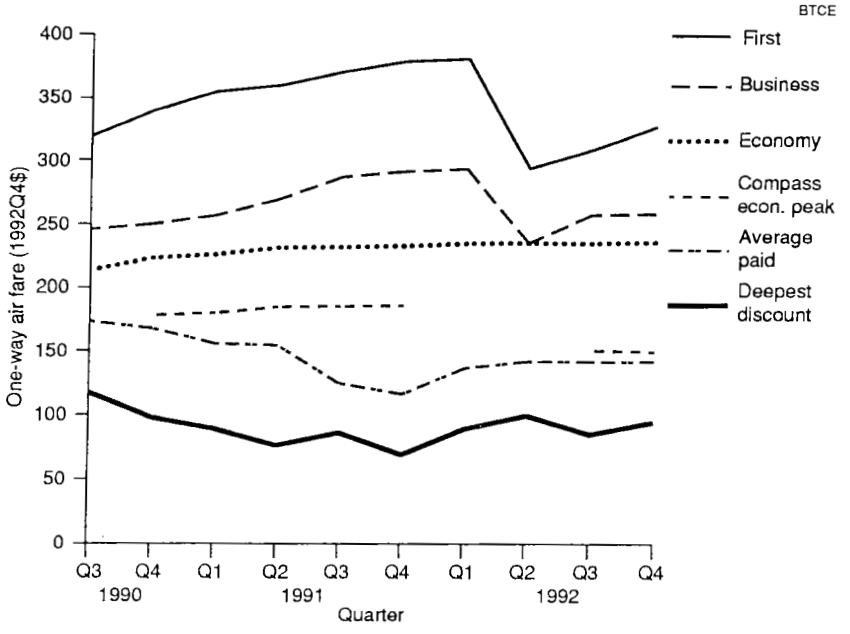
6. First, business and economy fares shown are averages based on monthly survey data for Ansett, Australian and Eastwest.

   Compass economy fares shown are peak period fares — Compass Mk1 also offered off-peak fares on some evening services at roughly 50 per cent of the full economy fare charged by Ansett and Australian. Compass Mk2 off-peak fares for the routes illustrated were $20 below peak fares.

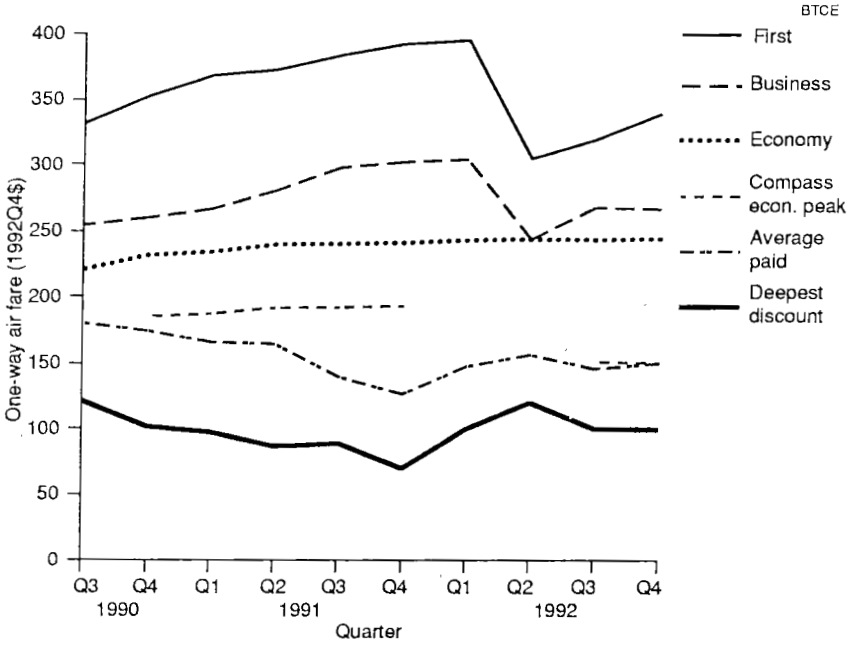
   The average fare paid for the September quarter 1990 is estimated as 0.814 times the full economy fare (the 1989–90 ratio of economy to average fare) (IAFC 1990). From this base, average fares for later quarters are calculated using Prices Surveillance Authority data on the movement of average fares on these specific routes. Given the limitations of this methodology, average fares should be considered indicative only of relative price rather than absolute price.

   Deepest discount fares are obtained from a variety of sources and are meant to be illustrative only of the depth of discount offers. Some of the fares shown were available only for short periods during a quarter, and it is possible that certain promotional or short period discount fares deeper than those shown were missed during the fare surveys.



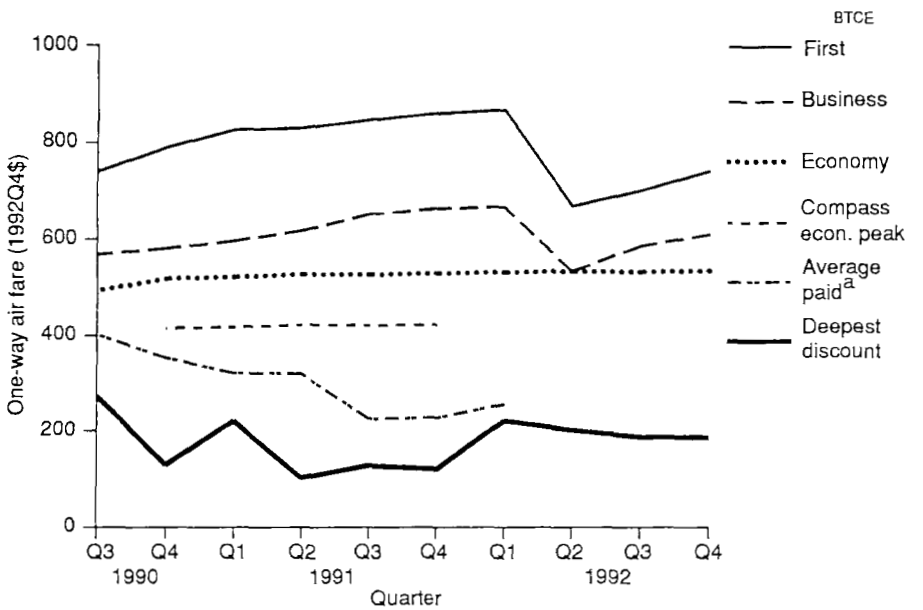
Sources DTC, PSA, BTCE estimates.

Figure 6.6 Real air fares paid for one-way travel Melbourne–Sydney



Sources DTC, PSA, BTCE estimates.

Figure 6.7 Real air fares paid for one-way travel Brisbane–Sydney



a. Data unavailable beyond 1992Q1.

Sources DTC, PSA, BTCE estimates.

Figure 6.8 Real air fares paid for one-way travel Melbourne–Perth

quarter to levels significantly below those at the start of deregulation. Both first and business class fares then rose through to the December quarter 1992 to reach levels which in real terms were slightly higher than those just prior to deregulation. First class fares were 0 to 3 per cent above pre-deregulation levels, while business class fares were consistently 5 to 7 per cent above.

The second point of interest is the steady increase in the economy fare (Ansett, Eastwest and Australian) through to the June quarter 1991, followed by a period of negligible growth through to the December quarter 1992. The full economy fare offered by Ansett and Australian in the December quarter 1992 was 8 to 11 per cent higher in real terms than immediately prior to deregulation. From December 1990 through to December 1991 Compass Mk1 offered a full economy peak fare that was around 20 per cent less than that offered by Ansett and Australian, and an off-peak fare around 50 per cent less. The peak full economy fare of Compass Mk2 offered in the September and December quarters of 1992 was noticeably lower than this, being around 37 per cent less than the Ansett and Australian full economy fare. The Compass Mk2 off-peak fare was around 45 per cent lower.

The third common point of interest is the turning point reversing the decline of the average fare series. The average fare for all three routes increased

between the December 1991 and March 1992 quarters. This coincides with the exit from the market of Compass Mk1, which as suggested by the Prices Surveillance Authority (PSA 1992a) led to a reduction in the availability of discount fares due to the removal of Compass' capacity. It may however be incorrect to attribute the rise solely to the exit of Compass as it is possible that seasonal factors such as a decline in leisure traffic following the Christmas holiday period may have also contributed. Despite the rise in average fares, for both routes where data were available (Brisbane–Sydney and Melbourne–Sydney) the average fare in the December quarter of 1992 was still lower — 17 to 18 per cent in real terms — than prior to deregulation.

The main point of difference between the different routes concerns the depth of the deepest discount and the depth of the average fare paid as a proportion of the economy fare, particularly noticeable in the September and December quarters of 1991. Discounts were deeper and were greater utilised on the Melbourne–Perth route than on the east coast routes. This finding also applies to the Perth–Sydney route (not illustrated) and can possibly be attributed to a combination of factors, such as the emergence of uncommercial discounts during the 1991 fare wars between Compass Mk1 and the incumbent operators, a greater proportion of new seats on the Perth routes, and that distance-based operating cost reductions allow for greater fare cuts on long-haul routes.

FARE DISCOUNTING

Depth of post-deregulation discount fares

The last two years, in particular the second half of 1991, are peppered with examples of short period seat sales, promotional offers and spot discounts such as a $100 one-way fare for travel between Melbourne and Perth. However, were such deeply discounted fares available to all travellers on the domestic network?

To answer this question definitively and to track changes over time one would require a comprehensive set of listed fares data spanning all routes on the network, coupled with some measure of the actual capacity made available to and utilised by travellers at discount rates. However, an indicative answer can be obtained by taking one month's worth of listed fare data and examining whether the depth of the discount fare (percentage off the full economy) differs for primary trunk routes and for less dense routes. This may illustrate in a general sense whether travellers on the dense primary routes have access to deeper discounts than travellers on other routes.

Listed fare data (full economy and deepest discount) for all domestic operators on the top 30 air routes were obtained from the Fantasia computerised reservation system for the month of December 1992. The data were split into

TABLE 6.3 COMPARISON OF DEEPEST DISCOUNT FARES BETWEEN PRIMARY AND LESS DENSE DOMESTIC ROUTES, DECEMBER 1992

Route grouping	*Average deepest discount[a] (per cent)*	*Average number of competitors[b]*	*Percentage of routes served by Compass (per cent)*
Primary routes[c]	59	3.6	100
Less dense routes[d]	56	2.4	16

a. The discount is measured as the percentage *off* the full economy fare.

b. Domestic airlines (Australian, Ansett, Compass, Eastwest) operating on a route.

c. Adelaide–Melbourne, Adelaide–Sydney, Brisbane–Melbourne, Brisbane–Sydney, Melbourne–Sydney.

d. The remaining 25 routes from the top 30 (based on 1991–92 traffic-on-board by stage).

Source BTCE estimates.

two categories, the 5 dense routes connecting Adelaide, Brisbane, Melbourne and Sydney, and the remaining 25 routes. The depth of discount was determined for each route and a simple average of these discounts obtained for each of the two groups. Also calculated for each of the two groups of routes is the average number of operators and the presence of Compass Airlines. Table 6.3 illustrates these findings.

Table 6.3 illustrates a small difference — approximately three per cent — in the depth of the deepest discount fare available to travellers on the primary capital-to-capital routes and the less dense routes. While a number of factors could be posited to explain the presence of the difference, such as the number of competitors and the presence of Compass stimulating more intense competition, or possible economies of route density, it is not possible from this analysis to draw any firm conclusions regarding whether the difference is significant.

Firstly, the percentage discount is between listed fare prices — full economy and deepest discount — and does not reflect the actual volume of fares available nor the uptake of the discounts. An alternative measure of the depth of 'available' discount fares between route groupings would be a comparison of the average fares paid as a proportion of the full economy fares listed. This would provide an indication of the true availability (and depth) of discounts. However, these data are not publicly available.

Secondly, the timing of the fare survey will have a bearing on the results. Factors such as seasonal stimulation of flat markets or short-term route-specific promotional discounts may generate somewhat different results than those shown above.

It is possibly reasonable to conclude that the above analysis indicates there is little evidence of any significant difference in the depth of the deepest discount fare between routes of different density. This is further borne out in the results of a cross-sectional regression analysis (see table 6.4), which indicate that traffic density as an explanator of the deepest discount fare is only marginally significant.

An additional question remains to be answered. Given that full economy fares have on average risen in real terms since deregulation and we speak of the best discount as a proportion of the full economy fare, how do these best discount fares compare to what was available prior to deregulation in absolute terms rather than as a percentage of the full fare?

The best adult discount fare generally available prior to deregulation was 45 per cent off the full economy fare offered by Ansett, Australian and Eastwest. The best discount after deregulation has already shown to have varied significantly between routes and over time, but if the average dense route discount ('primary routes' in table 6.3) for December 1992 is used at least one anecdotal picture emerges.

The average dense route discount, from table 6.3, was 59 per cent off the full economy fare. However, this is 59 per cent off a full economy fare which has increased over this period in real terms by around 13 per cent. To arrive at a clearer estimate of how the depth of discounts have varied we deflated the nominal December 1992 discount fare for each route to arrive at a real discount fare. These real discount fares are then compared to pre-deregulation full economy fares and the resultant percentage discounts averaged. It emerges that real post-deregulation discount fares represent an average discount of 54 per cent off pre-deregulation full economy prices. Thus, having adjusted for real growth in full economy fares, average post-deregulation discounts are still markedly deeper than the pre-deregulation discounts of 45 per cent.

Changes in discount fare conditions

There have been a number of substantial changes to the conditions associated with discount fare offers, changes which offer relative advantages or disadvantages depending on an individual traveller's priorities. To illustrate these changes the following discussion highlights the differences in the main conditions for the deepest discount fare generally available before and after deregulation.

From 1983, passengers travelling on trunk route services had available to them a wide range of discount fares approved by the Independent Air Fares Committee, priced at 20 to 45 per cent below full economy fares (IAFC 1990). The 45 per cent discount fare will therefore be considered as the best readily

available discount fare prior to deregulation. This fare (Flexi/Excursion fare) was offered by Ansett, Australian and Eastwest.

The best readily available post-deregulation discount fare at the time of writing (December 1992) was an approximately 60 per cent discount fare offered by Ansett, Australian, and Eastwest for travel on the primary interstate routes.

Selection of flight. In 1990 travellers wishing to use the 45 per cent discount fare (henceforth referred to as 'Flexifare') advised the airline of their desired day of travel. The airline later nominated the actual flight from those available. In 1992, this restriction no longer applied and travellers wishing to book a 60 per cent discount fare (henceforth referred to as a 'Seat Sale fare') could nominate the specific flight desired.

Advance booking requirement. In 1990 the Flexifare had to be booked and paid for between 4 and 14 days prior to departure. In 1992, the Seat Sale fare had to be booked at least 14 days prior to departure, and payment made within 3 days of booking, whichever came first.

Minimum/maximum stay restrictions. In 1990 a minimum stay away of one night was required to qualify for the Flexifare. The maximum stay away was 21 nights. In 1992, a minimum stay away of one night was still required to qualify for the Seat Sale fare, but it had to be a Saturday night. The maximum stay away duration was variable. For example, when the computerised reservation system was queried in late November for the Australian Airlines Seat Sale fare, all travel had to be completed by 5 February 93.

Cancellation refund/reticketing. In 1990, a 50 per cent fee applied if the journey was cancelled after registering. If the return journey was cancelled after completion of the forward journey, the full economy fare was charged for the forward journey and 50 per cent of the residual refunded. In 1992, no refunds were permitted once ticketed, and upgrading to a higher fare was not permitted. Changes to flights were permitted subject to availability of seats at the same discount class, within 14 days prior to travel; however, changes to destination were not.

Clearly, travel priorities differ between individual travellers. For example, one traveller booking a weekend holiday may value the ability to select a particular Friday evening flight but pay no heed to the restriction of staying away for a Saturday night. Another traveller pre-booking a mid-week working trip may have these priorities reversed. Such differing priorities make it impossible to draw conclusions as to whether changes to discount fare conditions since deregulation make discount travel more or less accessible.

Effect of competition on discount fares

One of the forecast benefits of deregulation was the assumption that greater competition facilitated through the entry of new operators would lead, inter alia, to lower fares for air travellers. There is no doubt that Compass Mk1 had a marked effect on the level and intensity of fare based competition. Some of the deepest discounts seen since deregulation occurred during the fare competition in late 1991 when Compass Mk1, Ansett and Australian sought to undercut one another's deepest discount prices.

The effect of Compass Mk1 on the depth of air fare discounts can and has been formally tested. A regression run in August 1991 (BTCE 1991c), indicated that the existence of Compass was a significant explanatory variable in determining the depth of the deepest discount air fare. This analysis found that the presence of Compass, by adding to the number of competitors, adding capacity and providing a 'maverick' in the market, had had a significant negative impact on fares. More generally, it was found that data on discount fare offers were consistent with the view that air fares had flag-fall and distance components and were responsive to the number of competitors on a route.

However, Compass Mk1 left the market in December 1991 and was replaced on 31 August 1992 by Compass Mk2, which had a significantly different pricing strategy. For the first four months of operations Compass Mk2 adhered to discount fares which were higher than equivalent fares of Ansett/Eastwest and Australian on many of its routes This strategy persisted until early in 1993 when Compass chose to match, but not undercut, even deeper discounts instigated by the incumbents to stimulate a flat post-Christmas market.

Given these differences between the pricing strategies of Compass Mk1 and Mk2 it is worthwhile re-examining the impact of competition, and in particular, the effect of Compass Mk2 on deepest discount fare prices. This is achieved by running a cross-sectional regression analysis using deepest discount fare data for the top 100 domestic air routes, for the month of November 1992.

The basic hypothesis is that air fares generally reflect cost variables such as stage length and route density. A flat flag fall (constant) covers the proportion of operating costs not related to length or density of the route. In addition, fares are expected to be lower, the more competitors there are on a route. The form of the relationship is therefore:

$$\text{Fare} = \text{Function}\{\text{Flag fall, Distance, Density, Competitors}\}$$

where the dependent variable (fare) is the maximum discount fare on offer on a route, and the explanatory variables are: flag fall is a constant term, distance is the great circle distance for the route, density is traffic volume of the route (measured in traffic-on-board by stage), and competitors are the number of

TABLE 6.4 REGRESSION RESULTS: DISCOUNT FARES, NOVEMBER 1992

Dependent variable	*Flag fall (constant term)*	*Great circle distance*	*Two competitors (dummy)*	*Three competitors (dummy)*	*Traffic density*	R^2
Discount fare	122	0.219	–0.0741	–0.0916		0.79
t-statistic	10.00	16.01	–6.56	–5.80		
Discount fare	128	0.215	–0.0712	–0.0824	–0.000022	0.80
t-statistic	10.09	15.46	–6.29	–4.93	–1.60	

Source BTCE estimates.

competitors on the route (for this regression, using November 1992 data, Ansett and Eastwest are treated as one competitor as are Australian and Qantas).

Two regressions were run. Both assumed a linear functional form and treated the number of competitors as dummy variables, that is, a dummy for two competitors which in all cases meant Ansett/Eastwest and Australian/Qantas operated on the route, and a dummy for three competitors which meant in all cases the existence of Compass Mk2 in competition with the two incumbent operators. Instead of the usual 0 or 1 value for the dummy variables the form used was 0 or 'great circle distance' to account for the fact that price cuts through competition are more likely to be related to savings obtainable through distance related operating cost reductions rather than flat cuts across all routes.

The results of the analysis are summarised in table 6.4. They provide further support for the hypothesis that competition is important in keeping air fares low. In particular, the coefficients for two and three competitors were negative and statistically significant, indicating that the depth of discount is in part determined by the number of competitors operating on a route. The majority of the competition-based downward adjustment to the air fare is explained by the existence of two competitors — in all cases this means Ansett/Eastwest and Australian. The presence of a third competitor on a route, in all cases meaning Compass, does result in a deeper discount fare; however, the additional difference exerted by the presence of Compass is slight, being about 1.8 cents per kilometre of route length.

The coefficient for the number of passengers on a route was negative but only marginally significant, providing a weak indication that perhaps operators are adjusting fares to account for economies of route density. However, an alternative explanation could be that denser routes may allow for a relatively small number of very deep discounts to be offered, any losses from these fares being amortised by the greater number of passengers paying higher fares. It must be remembered that the dependent variable is the deepest

available discount fare listed. The actual number of these fares sold or the relative proportion of sales on each route was not publicly available.

Compass Mk2 discount pricing competition

Prior to commencing operations, Compass Airlines Mk2 indicated that unlike its predecessor it was not going to be drawn into deep discount fare competition such as was seen in the second half of 1991. True to this statement, upon entering the market Compass did not respond to the deeper discounts of its competitors, a move which led to a number of interesting developments. One such development saw Ansett and Australian offering a Melbourne–Sydney discount fare of $169 return in August 1992 (immediately prior to Compass Mk2's entry). Compass entered the route with its cheapest return fare set at $200 and did not alter it. Soon afterwards Ansett and Australian fares increased to $189.

However, in early January 1993 Compass changed its stance and lowered prices to match the discounts announced by Ansett and Australian (6 and 7 January) to stimulate the traditionally quiet post-Christmas market. These included fares such as $218 return from Melbourne to Brisbane, and $138 return from Melbourne to Sydney, representing discounts of 71 per cent off the full economy fares offered by Ansett and Australian on these routes, or from Compass' point of view, a reduction of their deepest discount fares from $280 to $218 and $190 to $138 respectively. While Compass Mk2 matched these prices it did not engage in any price leading behaviour. Sam Coats was quoted as saying that Compass will not discount its fares 'a penny under' the competition (*Herald Sun*, 8 January 1993, p.5).

Availability of discount fares

The movement of average fares since deregulation gives some indication of changes in the number of travellers able to make use of discount fare offers. It is reasonable to assume that real decreases in the average fare paid indicate,

TABLE 6.5 PROPORTION OF TRAVELLERS UTILISING DISCOUNT FARES

(per cent)

	1990		*1991*				*1992*			
	Q3	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*
Discount fare utilisation	45	50	55	60	65	70	60	55	60	65

Source BTCE estimates.

all other factors being equal, that either discounts were becoming deeper, or more travellers were taking advantage of discount fares, or more probably a combination of the two. However, there are several problems with assuming this relationship. Firstly, the simple relationship is obfuscated by changes in full economy and premium fares. Secondly, while average fare paid gives a general indication of changes in relative proportions over time, it does not give absolute percentages of discount fare utilisation.

A methodology has been constructed that allows for calculation of absolute numbers of travellers purchasing discount fares.[7] The methodology avoids the problems of using changes in average fares paid, instead taking into account real changes in the price of full economy travel, and changes in the number of premium fare sales. While this methodology provides a good indication of the proportion of travellers using discount fares and will illustrate the direction of change in this proportion, the estimates should be viewed as conservative.

Table 6.5 presents quarterly estimates of the number of people travelling on discount air fares since deregulation. The estimates correlate well with the estimate in IAFC (1990) that 45 per cent of passengers travelled on discount on the eve of deregulation, and the estimate in BTCE (1991c) that the percentage of discount fare passengers was about 50 per cent by May 1990 and then increased to between 60 and 70 per cent by October 1991.

Table 6.5 provides a good general illustration of discount fare availability across the network. However, it does not indicate which classes of discount are being utilised, on what routes and in what volume. Nor does it answer the question of just how available are the highly publicised very deep discounts.

This is clearly a question of many parts and to attempt to answer it in full for the 100-odd domestic air routes is not possible with the limited data available.

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7. The methodology for deriving these estimates was as follows.

   Firstly the number of pre-deregulation full economy fare passengers was determined. This estimate consists of the residual when the known number of premium fare passengers was subtracted from 55 per cent of the total passengers for the September quarter 1990. The assumption made here was that 45 per cent of all passengers travelled on discount just prior to deregulation (IAFC 1990).

   Using the real indices of change for the average full economy fare, the petrol price index (PPI) and gross non-farm domestic product (GNFP) and assuming elasticities of –0.49 (real price), +0.08 (real PPI), and +1.1 (real GNFP) and adjusting for seasonal variation, the number of full fare passengers was determined for each post-deregulation quarter (see appendix V of this report for more detail on the parameters of the demand forecasting model).

   Lastly, the known number of premium fare passengers was added to the full fare passenger estimate and this sum subtracted from the known total number of passengers for each quarter. The residual represented a quarterly estimate of the number of passengers utilising discount fares.

However, it is possible to examine the availability of the deepest discount fare for a small sample of routes for a given date and time period, and thus provide at least one indication of deepest discount availability.

A specific set of flights departing 17 December 1992 on three different domestic routes was chosen for analysis (table 6.6). The routes were Melbourne–Sydney, Brisbane–Cairns, and Melbourne–Perth. Using the Fantasia computerised reservation system, discount seat availability was queried for each of these flights, once per day, 3 to 5 days per week for the 6 weeks preceding 17 December. Availability was queried for Australian Q class, Ansett L class, Eastwest L class, Compass V class, and Qantas Q class. The results for individual operators and individual flights were then

TABLE 6.6 ROUTES INVESTIGATED IN AVAILABILITY SURVEY, FLIGHT NUMBERS, DEPARTURE TIMES AND FLIGHT GROUPS

Route	*Flight group*	*Flight time*	*Operator and flight number*
Melbourne to Sydney	Peak	0600	AN10
		0620	TN530
		0620	QF59
		0625	YM2
		0645	AN12
		0650	TN572
		0700	AN14
		0705	YM30
	Off peak	1100	TN416
		1100	AN26
		1100	YM10
		1200	AN28
		1200	TN454
Brisbane to Cairns	Morning	0740	AN2
		0755	TN494
		0850	QF69
		0940	AN62
		0940	TN420
		0945	YM30
	Midday	1045	EW388
		1230	TN25
		1310	AN124
Melbourne to Perth	All day	0855	AN7
		0930	TN4
		1440	TN20
		1455	AN27
		1825	AN35
		1840	TN14

TABLE 6.7 AVAILABILITY OF DEEPEST DISCOUNT FARES, FOR A SAMPLE OF ROUTES AND FLIGHT GROUPS FOR FORWARD TRAVEL ON 17 DECEMBER 1992

(seats available)

	Period prior to departure date			
Route and flight group	*6 weeks*	*5 weeks*	*4 weeks*	*3 weeks*
Melbourne–Sydney (peak)	55	50	46	43
Melbourne–Sydney (off-peak)	31	28	27	34
Brisbane–Canberra (morning)	43	43	40	34
Brisbane–Canberra (midday)	21	16	14	10
Melbourne–Perth (all day)	0	0	0	0

Note These discounts were only available more than 2 weeks before departure.

Source Fantasia computerised reservation system.

aggregated into time periods in order to provide windows of aggregate availability.

The results of the availability survey are summarised in table 6.7.[8]

Despite the small sample size, a number of interesting points are illustrated by the results in table 6.7.

Firstly, and most importantly, a number of deep discount seats *were* available during the period studied, at least for Melbourne–Sydney and Brisbane–Cairns, assuming that a traveller was prepared to take any flight within a given time period. The discounts were subject of course to the minimum pre-purchase period of 14 days This finding illustrates that the deepest discount fares advertised are available in reasonable numbers and are not simply publicity generating mechanisms. It should be noted that this sample does not include any short-term promotional offers, or fares as deep as those available in the last half of 1991.

The apparent lack of deep discount seats on the Melbourne–Perth route can probably be explained by the fact that 17 December being close to Christmas

8. In fact the number presented is 'at least' the number of seats available. Airline seats are released onto the computer reservation system in blocks. Thus the number of seats available on a flight at a particular query point may be increased later if another block is subsequently released. However, it is fair to assume that consecutive zero availability for a number of days indicates all discount seats are sold. A further problem with the data concerns the availability of Compass seats. The computerised reservation system did not allow an up-to-the-minute view of Compass discount seat availability. Thus, the total number of available seats may have included some Compass seats which had been sold but were still displayed as available.

led to the advance purchase of all discount seats well before the departure date. This conclusion is reinforced by the fact that by 15 December all seats (all fare classes) on the six flights sampled for this route were sold out, which was not the case for the groupings studied on other routes sampled. Why was this not also the case on the Brisbane–Cairns flights, another popular Christmas holiday route? This limited study does not provide a definitive answer; however, further study may reveal the answer lies in the total amount of seat capacity made available between the respective city pairs, available capacity being tied in with an airline's management of yield.

CONCLUSIONS ON DOMESTIC AIR FARES

One of the objectives of deregulation was to create an environment that would generate 'a wider range of air fares, in particular an increased availability of discount fares' (Evans 1987, p.3). This has been realised. On average, Australian domestic air travel has become cheaper since deregulation due solely to a greater availability of discount fares, a development in which the presence of Compass Mk1 and Mk2, as well as the emergence of competition between Ansett and Australian, have all been contributing factors.

The main beneficiaries of lower prices are travellers able or prepared to fly on discount fares. The proportion of travellers utilising discount fares has increased from around 45 per cent prior to deregulation to a peak of 70 per cent in the December quarter 1991.

However, travel has not been cheaper for all. While discount fares have become deeper and more available, full economy fares, first and business class fares have all risen in real terms. Full economy travel in the December quarter 1992 was around 14 per cent more expensive in real terms than just prior to deregulation, and despite massive reductions in premium fares in the June quarter 1992, by the December quarter business class fares had edged back up to a level 12 per cent higher in real terms than pre-deregulation prices, and first class fares were up 6 per cent.

It should also be noted that the full economy fares of both Compass Mk1 and Mk2 and the business class fares of Compass Mk2 were substantially cheaper than those of the incumbents, thus offering the last-minute purchase and reticketing flexibility of a full fare to business travellers at a price less in real terms than the incumbents' pre-deregulation full fares. The availability and attractiveness of these Compass Mk2 fares should, however, be considered in the light of business travellers being not only price sensitive but also quality sensitive. Compass Mk2 was not apparently able to match the incumbents in terms of such quality attributes as network coverage, business lounge perks, frequent flyer benefits and so on, as reflected in the lower than forecast yields obtained by the airline during its six months of operation.

CHAPTER 7 CHANGES IN SERVICE QUALITY

A meaningful concept of service quality must have reference to supplying the needs and wants of individual consumers. In recent years, the Australian aviation industry has adopted an attitude towards service quality which is more customer and market-oriented. Also, since deregulation, the airlines have been able to offer consumers a much greater range of fare – quality of service combinations from which to choose.

This chapter discusses changes in the quality of service provided by the regular public transport passenger aviation industry in the post-reform period. Where more recent data have become available, it updates previous work published in BTCE Report 80, Quality of Service in Australian Passenger Aviation (BTCE 1992a).

DEFINITION OF SERVICE QUALITY

The Bureau's conceptual work on the measurement of quality of service (BTCE 1992b) builds on the framework developed by Lancaster (1966) for analysing service quality.

Under Lancaster's approach, a product or service is viewed as a bundle of characteristics. Consumers derive utility from the characteristics embodied in the product or service rather than from the product or service per se. Characteristics are defined as 'those objective properties of things that are relevant to choice by people' (Lancaster 1971, p. 6). Several characteristics may be aggregated into an aspect of service quality.

The concept of service quality refers to the quantities of the characteristics that are embodied in a service and which directly interact with the utility functions of the consumers of that service. In the context of this chapter, quality of service incorporates all aspects of the total service provided to air passengers by the airlines, organisations which provide airport and airways services, and regulatory agencies.

THE ROLE OF QUALITY OF SERVICE MEASUREMENT

Overseas experience has shown that aviation reform can have unexpected results in terms of the quality of service provided by the industry. For example, an increase in the frequency of flights can lead to a decrease in on-time performance. A system of measurement of relevant aspects of quality of service is therefore essential to any analysis of the success of the reform measures implemented.

Measures of service quality complement other measures of industry conduct and performance such as passenger numbers, price levels, operators' financial performance and productivity. Indeed, it could provide a misleading impression of the progress of reform if, for example, it were publicised that prices had been reduced, while at the same time service quality was declining and this latter fact was not also brought to attention.

In the interim at least, it is important that quality of service be monitored, partly to ascertain that the expected outcomes from reform are being achieved and partly to assist the process of reform itself, through providing information which facilitates the efficient functioning of the reformed markets. For example, quality of service indicators can provide the basis for consumers to make informed choices between operators and thereby encourage the provision of standards of quality appropriate to consumer needs.

IDENTIFYING KEY ASPECTS OF SERVICE QUALITY

Identification of the key aspects of quality in aviation services must take account of the segmentation of the market. The priorities of business travellers will differ from those of holiday travellers, although some aspects, such as safety, may be equally important to all passengers. Within these groups short-haul passengers may well have different priorities from long-distance passengers. To some extent consumers' perceptions of service quality are also determined by external factors. For instance, travellers to and from remote locations may consider a daily service is adequate, while travellers on intercapital routes may expect a standard of fifteen-minute intervals between services.

Lancastrian theory postulates that consumers have a hierarchy of needs or preferences, with lower ranking needs assuming importance only as the higher order needs are satisfied. (Shaw 1990 expressed this theory in terms of consumers 'needs' and 'wants'. A 'need' is something which it is essential the customer receives whereas a 'want' cannot be said to have a crucial importance to the traveller.) This theory can be applied in the aviation sector where, for instance, the availability of a flight at a convenient time would generally take precedence over on-board comfort (Carlzon 1987).

Observation of the activities of the Australian regular public transport (RPT) aviation industry and of comparable industries or situations overseas was used in this study to obtain qualitative information on consumer valuations of some aspects of service quality. Examples of industry activities over recent years which have had an impact on the quality of service provided include:

- increasing the frequency of flights on many routes;
- the airlines' choices of aircraft type;
- the upgrading of the airlines' facilities at airports;
- changes in airline routes (for example, the introduction of non-stop flights on some routes) and types of aircraft operated on particular routes; and
- improvements in quality and availability of services and facilities both on the ground and on board.

Advertisements by the airlines also provide an insight into which aspects the industry considers to be of importance. The quality of service aspects which are most frequently advertised by the airlines include terminal facilities, safety, service, on-board comfort, network size and convenience of schedules and routes.

Studies of the effects of deregulation in overseas aviation markets provide some guidance on which aspects of service quality to assess when evaluating the impact of Australian domestic deregulation. The most frequently discussed aspects of service quality include safety, flight frequency, on-time performance, non-stop services, airport services, on-board comfort and service, and load factors.

Based on observation of industry activities in recent years, and the evidence from overseas studies, the following aspects[1] were considered to be highest priority for inclusion in a quality of service measurement system for the Australian RPT aviation industry:

- safety;
- passenger accessibility to the RPT network;
- frequency of service;
- non-stop service;
- on-time performance;
- airport services and facilities; and
- on-board comfort and service.

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1. Aspects are listed in random order as consumer valuations of the various aspects were unknown.

MEASURING SERVICE QUALITY WITH INDICATORS

Changes in service quality can be assessed on the basis of quantitative measures of the characteristics of a service, or on the basis of qualitative judgments. Quantitative indicators of service quality have been compiled for this study wherever possible. An indicator is defined as a statistical measure of an aspect of service quality.

The remainder of this chapter discusses appropriate indicators or proxy indicators which could be used to measure changes in the key aspects of service quality. Where data were available, tables and figures are presented to show recent changes in quality levels.

INDICATORS OF SAFETY

Although many determinants of aviation safety have been documented, no system has been able to accurately predict aircraft accident rates based on changes in safety related factors. Safety levels are therefore measured after the fact using records of accidents, injuries, and fatalities. In this study the number of accidents per 100 000 hours flown by RPT aircraft and the total number of injuries suffered by RPT passengers were used as indicators of safety.

Accidents were defined as occurrences which take place between the time any person boards an aircraft with the intention of flight until such time as all such persons have disembarked, in which:

- a person is fatally or seriously injured (except when the injuries are from natural causes, self inflicted or inflicted by other persons); or
- the aircraft incurs substantial damage, is destroyed or is missing or completely inaccessible.

Tables 7.1 and 7.2 show the number of accidents and injuries incurred by the domestic airlines and regional operators respectively over the 1982 to 1992 period. As indicated in the tables, there were very few accidents in the RPT aviation industry over this period. At the time of writing, the domestic airlines in Australia had had no fatal accidents since 1968 and there had never been a fatal accident involving jet aircraft in the RPT sector. The large number of injuries incurred by domestic airline passengers in 1987 resulted from the use of escape slides in a single accident.

During the period September 1991 through March 1992 a comprehensive review of the capability of the Australian Air Traffic Services System to maintain safe separation between aircraft was undertaken (Ratner Associates Inc. 1992). The review team found Australia's existing system to be safe, and endorsed the capability of the system changes under way to further improve

TABLE 7.1 ACCIDENTS AND INJURIES — DOMESTIC AIRLINES IN AUSTRALIA

Year	Total accidents	Accidents per 100 000 hours flown	Minor injuries	Serious injuries	Total injuries
1982	1	0.39	0	0	0
1983	1	0.42	0	0	0
1984	0	0	0	0	0
1985	0	0	0	0	0
1986	1	0.37	0	0	0
1987	1	0.35	59	2	61
1988	0	0	0	0	0
1989	2	0.91	0	1	1
1990	2	0.78	1	2	3
1991	1	0.32	0	0	0
1992	1	0.29	2	0	2
Total	10	0.34	62	5	67

Source Bureau of Air Safety Investigation.

TABLE 7.2 ACCIDENTS AND INJURIES — REGIONAL AIRLINES IN AUSTRALIA

Year	Total accidents	Accidents per 100 000 hours flown	Minor injuries	Serious injuries	Fatal injuries	Total injuries
1982	3	1.99	2	0	0	2
1983	3	2.04	1	0	0	1
1984	0	0	0	0	0	0
1985	5	3.48	1	6	1	8
1986	0	0	0	0	0	0
1987	1	0.66	0	0	0	0
1988	8	4.55	7	3	3	13
1989	0	0	0	0	0	0
1990	7	3.46	0	0	0	0
1991	3	1.43	0	0	0	0
1992	6	na	0	0	0	0
Total	36	na	11	9	4	24

na Not available

Source Bureau of Air Safety Investigation.

safety. However, it was concluded that there is 'substantial room for improvement' and the review team made 24 recommendations for improving air safety. The Civil Aviation Authority and the Bureau of Air Safety Investigation had implemented all of the recommendations by the end of 1992.

After several years of aviation reform in Australia, including the first two years of deregulated interstate operations, there has been no evidence of an increase in accident rates in the domestic RPT aviation sector.

INDICATORS OF PASSENGER ACCESSIBILITY TO THE RPT NETWORK

In the context of this study, accessibility refers to the availability of RPT aviation services within a particular community. Loss of RPT services by some communities in remote areas of Australia could be particularly disruptive to residents due to the long distance to the next airport. In the United States a number of non-hub communities lost all RPT air service following deregulation (Morrison & Winston 1986).

The indicator of changes in passenger accessibility to the network used in this study was incidents of withdrawal of all RPT services from an airport, or commencement of services where they were not previously available. Industry sources and press reports were monitored to obtain information on changes in accessibility.

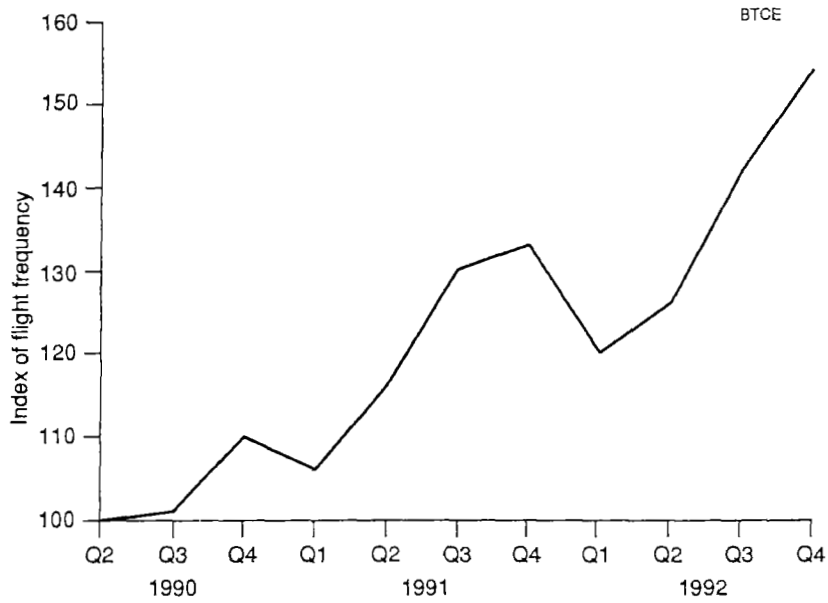
As at the end of 1992, passenger accessibility to the RPT network had not been adversely affected. There had been many changes in route networks, operators and types of aircraft used on particular routes, but no communities had lost all RPT services as a result of interstate deregulation or other aviation reform measures.

The experience to the time of writing suggested that when there were disruptions to services, other operators, often using aircraft that they claimed were more suited to the particular routes, quickly recommenced services. For example, when Hazelton Airlines withdrew services to 14 New South Wales communities in September 1991, all of the routes were soon taken up by other operators. When the New South Wales Government announced in June 1992 that some intrastate routes would be partially deregulated from January 1993, several airlines applied to operate on the routes.

FREQUENCY OF SERVICE INDICATORS

Quality of service improves with increasing frequency of service because consumers have a greater choice of departure times and, provided at least the same number of seats are available, a greater probability of being able to book a flight at short notice.[2] The importance of this aspect of service varies for different market segments and is relative to traffic volumes on particular routes during peak and non-peak periods. Thus, for example, business travellers would highly value an increase in frequency on the major intercapital city

2. The probability of being able to book a flight at short notice will only increase if the increase in flight frequency results in at least the same availability of seats. If an increase in flight frequency merely reflects increasing demand, or if there is a substitution of smaller aircraft on a particular route, an increase in the frequency of flights may not maintain or increase the availability of seats.



Source BTCE (from DTC aviation statistics database).

Figure 7.1 Flight frequency index, top 50 routes

routes during peak periods. Studies of the effects of deregulation in the United States have concluded that an increase in the frequency of flights between many locations has been one of the main benefits to consumers (US Department of Transportation 1990).

In order to assess the impact of deregulation in Australia on the frequency of service, a quarterly index of flight frequency for the top 50 domestic airline routes[3] over the period June 1990 to December 1992 was constructed. Figure 7.1 illustrates that the flight frequency on the top 50 routes increased by about 29 per cent between the September quarter 1990 (the last full quarter prior to deregulation) and the September quarter 1991. There was a further increase of about 9 per cent between the 1991 and 1992 September quarters.

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3. The routes included in the index were those which were in the top 50 routes on the basis of passenger numbers during the June 1990 quarter and which continued to be served in every subsequent period. The index was constructed according to Laspeyres formula (that is, $\Sigma q_{ni} p_{0i} / \Sigma q_{0i} p_{0i}$ where q_{ni} is the number of flights in period n on route i, and p_{0i} is the number of passengers in period 0 on route i) weighted by the number of passengers on each route in the June quarter 1990. A weighted index was used to reflect the relatively greater consumer benefit from increases in frequency on higher density routes.

Frequency continued to increase in the final quarter of 1992; the index was 16 per cent higher than in the December quarter 1991.

A time series showing flight frequency by the domestic airlines on 38 selected routes[4] for the September quarters in 1990, 1991 and 1992 is presented in appendix I. The number of trips on these routes increased by 30 per cent over the period (appendix table I.1).

The data in figure 7.1 and appendix table I.1 indicate that consumers benefited from an overall increase in flight frequency following deregulation. However, as shown in appendix table I.1, average load factors increased substantially on many routes in the September quarters of 1991 and 1992. High load factors may have meant that some passengers were denied boarding on the flight of their choice, forcing them into a less convenient time for departure. The net impact on consumer welfare of greater frequency and higher load factors was a welfare gain in the first half of 1991, a smaller welfare loss in the second half of the year, and further gains during the first three quarters of 1992 (see chapter 9).

INDICATORS OF NON-STOP SERVICE

Consumer benefits from non-stop services include shorter transit times, reduced anxiety for passengers because of fewer landings and take-offs, greater security for luggage, and avoidance of the inconvenience of changing aircraft.

Consumers would generally prefer to fly non-stop between their origin and destination airports. However, there is often a trade-off between the service quality aspects of frequency and non-stop service. Thus, for example, following deregulation in the United States, there was a decrease in non-stop services between many locations due in large measure to the establishment of hub-and-spoke networks. The hub-and-spoke system enabled the airlines to offer increased frequency of service between hub-and-spoke locations at the expense of a decrease in non-stop services between many non-hub locations.

An analysis of non-stop passenger services provided by the domestic airlines indicated that the number of non-stop city pair routes had increased from 154 in the September quarter 1991 to 177 in the September quarter of 1992.

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4. The 38 routes included were those which were in the top 40 routes on the basis of passenger numbers during January 1990, and which continued to be served by the major domestic airlines in each quarter. The two routes which were discontinued by the domestic airlines continued to be served (with an increase in frequency) by a major regional RPT carrier.

Appendix table I.1 shows that the frequency of non-stop flights on the busiest routes also increased substantially.

The available evidence on number of non-stop routes and frequency of non-stop flights indicated that there was a net benefit to consumers due to an increased availability of non-stop services to the end of September 1992.

INDICATORS OF ON-TIME PERFORMANCE

On-time performance indicators will assist in evaluating the performance of the incumbent airlines and any new entrants, as well as in determining if aviation infrastructure is coping with changing demand patterns.[5]

By international convention, aircraft arrivals at and departures from the terminal within 15 minutes of the scheduled times are considered to be on time. Delays of this magnitude can frequently be 'made up' or accommodated in the traveller's schedule with little or no inconvenience. However, consumer inconvenience may increase significantly with delays of longer duration.

From the consumer's point of view, the relevant aircraft departure and arrival times against which to measure on-time performance are the times which are listed in the airline's computer reservation system at the time the booking is made. Any change in arrival or departure times after the booking is made is likely to inconvenience the passenger. The degree of inconvenience can be assumed to increase as the remaining time before the scheduled departure decreases.

On-time performance indicators for the five mainland State capital airports were derived from raw data available from the flow management system of the CAA. The data were collected for internal CAA administrative purposes and were not compiled in a format which could easily be used to measure on-time performance. Considerable processing of the data was required to match records of arrivals and departures from the CAA's charging system with arrival and departure data provided by the airlines from their computer reservation systems. This process provided a large sample of matched aircraft arrivals and departures from which percentages of on-time and delayed arrivals and departures were calculated.

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5. In the United States a deterioration in on-time performance has been another major negative effect of deregulation. The increase in United States flight delays appears to have occurred primarily because infrastructure capacity has not kept pace with the increase in demand following deregulation (BTCE 1991c, p.54). On-time performance indicators for the ten largest United States carriers are published in the monthly *Air Travel Consumer Report* (US Department of Transportation 1992).

As the available arrival times were aircraft touchdown times, they were adjusted by 5 minutes to approximate arrival at the terminal. A departure was on time if the aircraft pushed back from the gate or was given permission to taxi within 15 minutes of the originally scheduled departure time. Originally scheduled times were considered to be appropriate for measuring on-time performance as, according to industry sources, about 90 per cent of passengers book their flights more than 24 hours in advance of departure and the vast majority of schedule changes occur within 24 hours of departure. These schedule changes therefore represent an inconvenience to most passengers who must adjust their affairs at short notice.

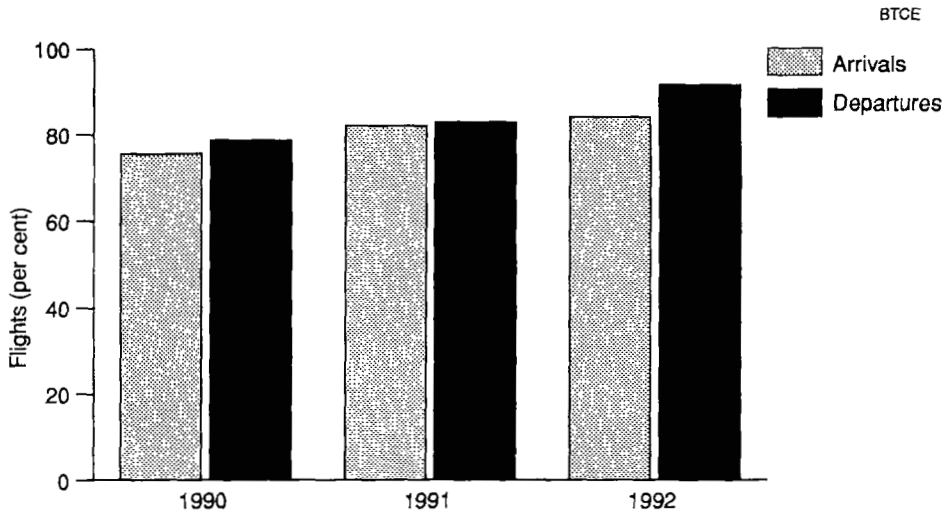
Figures 7.2 to 7.6 show the on-time performance of RPT operators at Sydney, Melbourne, Brisbane, Adelaide and Perth airports. For Sydney, Melbourne and Brisbane, data were available for the September quarters in 1990, 1991 and 1992, while for Adelaide and Perth only 1991 and 1992 data were available.

The figures show that there was an improvement in on-time performance at each of the airports over the periods analysed. The on-time performance of departures was better than that of arrivals for all airports in each quarter. Sydney had the best record for arrival performance in 1992 (84 per cent on time), followed by Brisbane with 82 per cent of arrivals on time. Approximately 94 per cent of aircraft departed on time from Adelaide, Brisbane and Melbourne in the September quarter 1992, followed by Sydney and Perth with 91 and 90 per cent, respectively, of departures on time. For the five airports 80 per cent of arrivals and 93 per cent of departures were on time during the September quarter 1992 compared with 76 per cent of arrivals and 85 per cent of departures on time in 1991.

In comparison, for the ten largest domestic carriers in the United States at the top five airports (measured by the number of scheduled domestic arrivals and departures) during the September quarter of 1992, approximately 80 per cent of arrivals and 86 per cent of departures were on time. Although the on-time performance of RPT operators in Australia compares favourably with the performance of airlines in the United States, it is evident that there is considerable scope for improvement in the on-time performance of the Australian industry, particularly for arrivals.

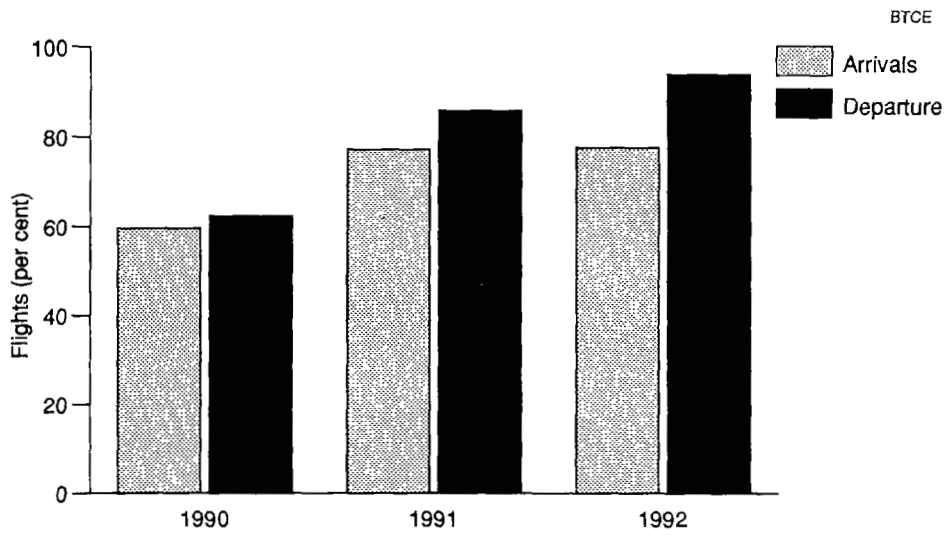
Appendix figures II.1 to II.5 depict aircraft arrival and departure delays at the five major airports. It must be remembered that, by definition, arrivals and departures are considered to be on time if they are within 15 minutes of the originally scheduled times. The delay time categories presented therefore start at 15 minutes after the scheduled times.

For all airports the data show that, for those aircraft which were delayed, most arrival and departure delays were between 15 and 29 minutes. Delays of 45 minutes or more occurred with about the same frequency as delays between



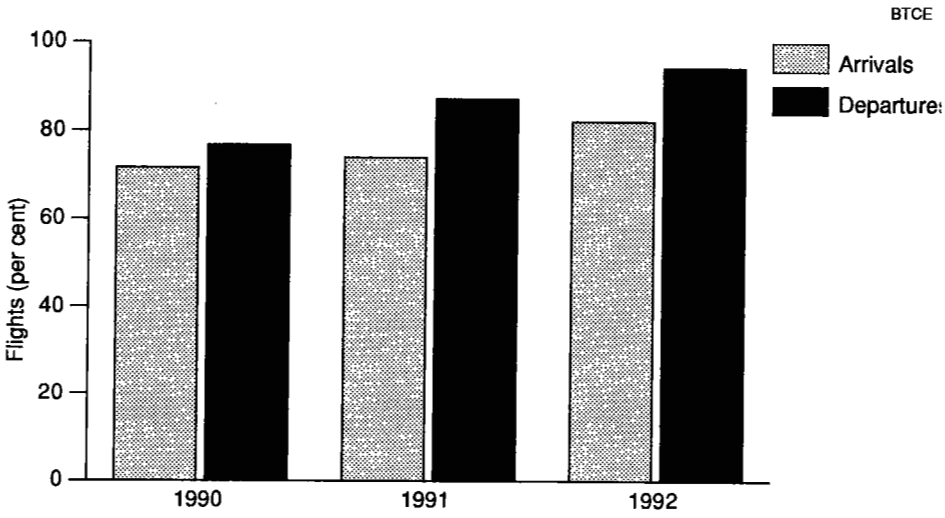
Source BTCE (from CAA flow management database).

Figure 7.2 Percentage of flights arriving and departing within 15 minutes of the scheduled time, Sydney, September quarter



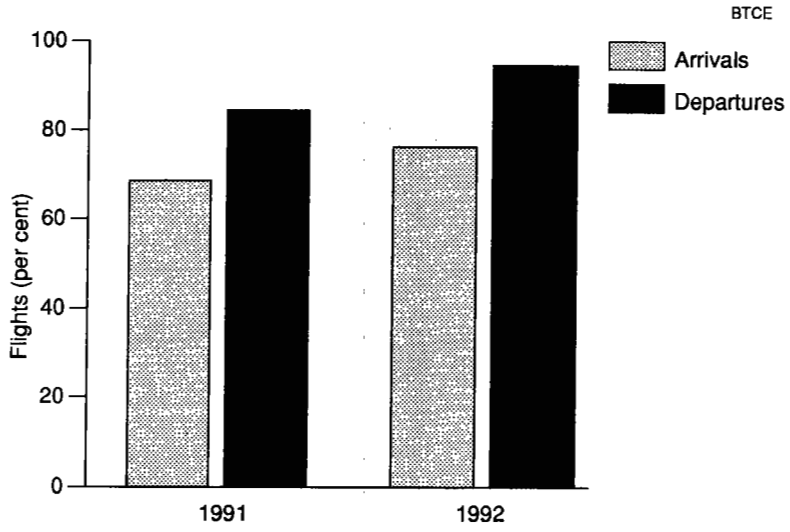
Source BTCE (from CAA flow management database).

Figure 7.3 Percentage of flights arriving and departing within 15 minutes of the scheduled time, Melbourne, September quarter



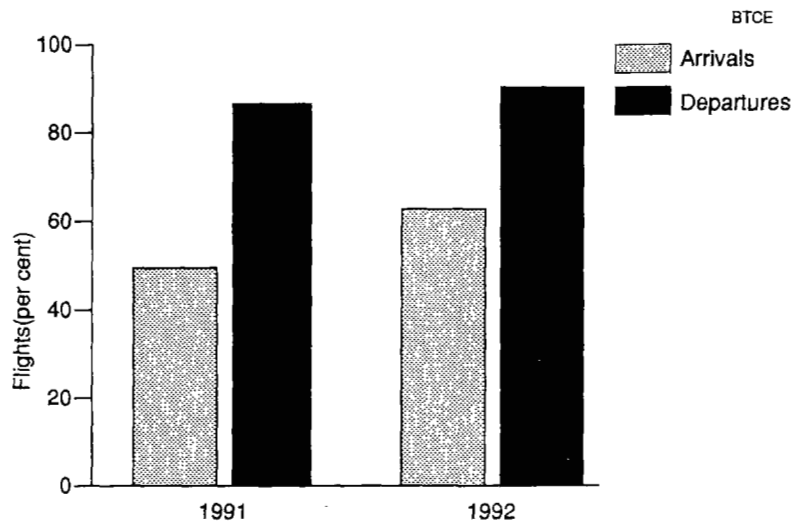
Source BTCE (from CAA flow management database).

Figure 7.4 Percentage of flights arriving and departing within 15 minutes of the scheduled time, Brisbane, September quarter



Source BTCE (from CAA flow management database).

Figure 7.5 Percentage of flights arriving and departing within 15 minutes of the scheduled time, Adelaide, September quarter



Source BTCE (from CAA flow management database).

Figure 7.6 Percentage of flights arriving and departing within 15 minutes of the scheduled time, Perth, September quarter

30 and 44 minutes. Additional information would have been required to determine which of several possible causes, such as airline procedures, industrial practices, infrastructure shortcomings, or the weather, delays were attributable to.

INDICATORS OF ON-BOARD COMFORT AND SERVICE

On-board comfort and service comprise numerous characteristics. An important determinant of on-board comfort is the space available for individual passengers. Other characteristics of on-board comfort include the quality of air conditioning and the stability of the aircraft. Characteristics of on-board service include the quality of the catering services provided, the friendliness of the cabin attendants, the provision of newspapers and magazines, and more recently the availability of on-board movies.

Passenger comfort and service is a major consideration in any airline's choice of aircraft type. The airlines' marketing strategies and the economics of the aircraft are both important in decisions on aircraft type and fit-out options such as galleys, carry-on baggage storage areas, and the pitch and width of seats. Variations in the levels of on-board comfort and service are also used to segment the market into premium and economy classes, with differing fares

applying to each class. Separate indicators of on-board comfort and service should therefore ideally be available for the various passenger categories.

With the exception of load factors (discussed below), there were no systematic measures of on-board comfort and service publicly available. Airline advertisements and media reports were monitored for information such as changes in the quality of seating and catering. These sources were the basis of the Bureau's conclusion that most passengers had benefited from improved on-board comfort and service in the first year of deregulation (BTCE 1991c, p. 58). Although some interesting experiments have been conducted since the collapse of the original Compass Airlines in December 1991 (see next section), present levels of on-board comfort and service appear to be similar to their pre-deregulation levels.

Competition through on-board comfort and service

Aspects of quality of service are frequently used by airline management as a means of non-price competition, particularly in the first and business class market segment, which is less price sensitive. Competitive measures which Australian domestic airlines have taken include provision of luxurious airline club lounges, priority ticketing and check-in procedures for premium class passengers, valet parking service, generous width and pitch of seats and provision of high quality catering and other on-board services such as newspapers and magazines in premium class cabins, and hire car and hotel reservation services.

Historically, any competitive quality of service measure taken by Ansett or Australian Airlines has invariably been matched by the other airline to prevent any erosion of market share. Some of the problems which Compass encountered in attempting to compete with Australian Airlines and Ansett on quality of service grounds were discussed in chapter 5. Some recent competitive measures involving on-board comfort and service are discussed here (see also box 7.1).

On 23 March 1992 Australian Airlines amalgamated business class and the previous first class at the business class fare while retaining first class service levels and two-abreast seating. Full economy fare passengers were provided with three-abreast seating with more leg room and improved catering. Discount fare passengers were offered the same conditions as previously applied in economy class, after a short period during which catering services were downgraded to cold meals only. Passengers paying the previous business class fare therefore received higher quality service while full economy fare passengers received both higher quality service and comfort. Conditions remained unchanged for passengers who previously paid first class fares and for discount fare passengers.

BOX 7.1 NOVEL IN-FLIGHT CATERING

When Compass Airlines Mk2 commenced operations on 31 August 1992 meals were presented to passengers in specially designed catering bags prior to boarding the aircraft. Compass claimed the advantages of this approach included:

- food was freshly prepared and had not been frozen and reheated;
- passengers were able to eat at their leisure; and
- cabin crew had more time available to serve refreshments, etc. to passengers.

The initial Compass fare structure offered lower standard economy fares than the incumbent airlines, although the cheapest discount fares available from Australian, Ansett, and Eastwest were lower than the cheapest Compass fares. Compass was therefore offering a greater availability of lower standard fares and a more basic service.

After approximately two months of trialling this method of catering, Compass discontinued the catering bags in favour of a tray service during the flight.

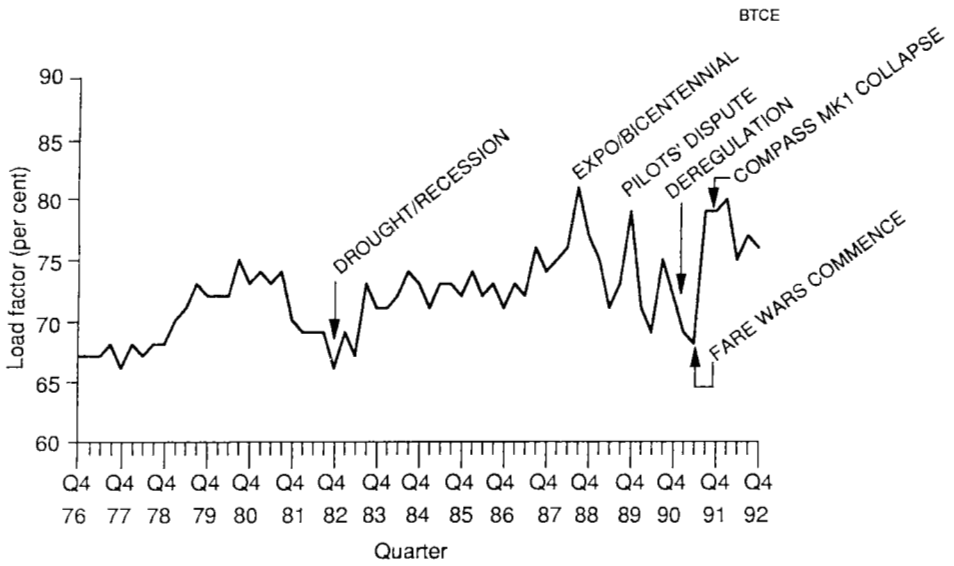
On Ansett flights, levels of comfort and service provided to first class passengers remained unchanged but fare levels were reduced to the business class fare. Business fares were reduced to the full economy fare with no change in service or comfort levels, including two-abreast seating. Full economy fare passengers were automatically upgraded to business class. Discount fare passengers remained in economy class with full economy service and three-abreast seating. Ansett therefore provided its first and business class passengers with the same levels of on-board comfort and service at reduced fares, and its full economy fare passengers with a significantly higher quality of comfort and service. There was no change in fares or levels of comfort and service for discount fare passengers.

As from 17 July 1992, Australian Airlines reinstated its previous first, business and economy class fare structure and cabin configuration. The main reason for this was reportedly because Australian Airlines was losing full economy fare passengers to Ansett where, for the same fare, they were provided two-abreast rather than three-abreast seating. Ansett fares also returned to their pre-March levels.

The above discussion demonstrates that the consumer's choice of airline is influenced by the quality of service provided. It also shows that an attempt by one airline to gain market share through providing a higher quality service can be countered through quality of service measures by competing airlines.

Load factors

High load factors result in more crowding in airport terminals (for example, during check-in and baggage retrieval) and on board the aircraft, and in



Source BTCE (from DTC aviation statistics database).

Figure 7.7 Domestic airline passenger load factors

increased ratios of passengers to flight attendants. High average load factors will also decrease the probability of many passengers being able to obtain their preferred choice of seating.

Beginning in the third quarter of 1991, average load factors for the domestic airlines increased substantially and remained high throughout 1992. As indicated in figure 7.7, with the exception of the third quarter of 1988 and the fourth quarter of 1989, more recent load factors were at historically high levels. The 1988 peak was attributable to demand generated by the Bicentennial celebrations. The 1989 peak was due to the restricted aircraft availability resulting from the airline pilots' strike. Lower load factors during the first half of 1991 reflected the increased airline capacity introduced by Compass. In the second half of 1991 load factors rose dramatically as a result of the increased demand generated by the extensive fare discount wars during that period. With the halt to Compass operations in December 1991, capacity was again reduced and the average load factor reached 80 per cent in the March 1992 quarter. Figures for the remainder of 1992 showed a decrease in load factors to 75 per cent in the June quarter followed by slightly higher figures in the September and December quarters.

INDICATORS OF AIRPORT SERVICES AND FACILITIES

Air passengers may spend as much or more time in airport terminals as they do in-flight. It is therefore important to measure the quality of service provided to consumers at airports. Quality of service of airports encompasses every aspect of their operations, including the infrastructure and facilities for handling aircraft in the air and on the ground and all facilities provided for passengers and other users.

A number of recent events in Australia attest to the importance of airport services and facilities as an aspect of quality of service. In the lead-up to deregulation an extensive program of investment in airport ground facilities and terminal buildings was commenced by the Federal Airports Corporation and by Ansett and Australian Airlines. During 1991–92 the FAC spent $250 million on improving and expanding facilities throughout its network (FAC 1992). In the debate over the third runway at Kingsford-Smith Airport and the second Sydney airport the advantages to the consumer and to the economy of having adequate airport facilities were stressed. The importance of terminal facilities and services such as airline club lounges and priority check-in procedures featured prominently in the debate over the Compass collapse (Nyathi, Hooper & Hensher 1992).

The premise established by Mumayiz and Ashford (1986) that delays in service are the most relevant measure of service quality at airports was applied in this study. Delays are the end result of the interaction between the numerous demand and supply factors which largely determine whether airport services and facilities are adequate. For example, the average size of aircraft using an airport has an impact on both the aircraft handling and the passenger processing facilities required. A larger average aircraft size places less demand on available aircraft handling facilities but increases the peak period demand on available passenger processing facilities.

Inadequate airport facilities will inevitably result in delays for passengers, whether due to late arrival or departure of aircraft, long queues at ticketing and check-in locations, or inadequate baggage handling, security clearance, or customs, immigration and quarantine clearance facilities. The remainder of this section provides an assessment of the success of airport infrastructure in handling the large increase in demand over recent years.

Aircraft handling facilities

One of the basic functions of airports is the provision of adequate runway, taxiway, apron and aircraft parking facilities to meet the demands of all users. Serious congestion problems have occurred in many countries throughout the world in recent years as infrastructure capacity has not kept pace with the increase in demand. To determine whether aviation infrastructure had coped with the considerable increase in demand following deregulation in Australia,

indicators of delays due to air traffic congestion at Kingsford-Smith Airport were obtained from the CAA.

It was considered that indicators of congestion delay at Kingsford-Smith would provide a good barometer of conditions throughout Australia, as Kingsford-Smith is the busiest airport and many flights between the State capitals are scheduled through Sydney. Delays in Sydney can therefore cause consequential delays at other airports. Also, beginning in September 1992, the CAA commenced a controlled departure time program whereby aircraft departing for Sydney are held on the ground at the departure airport if they would be unable to land at the scheduled time due to congestion in Sydney.

The indicators of delay produced by the CAA measure the difference between the normal time required for take-off or landing with no air traffic control intervention and the actual time taken.[6] The indicators measure only delays in the final stages of landing or departure which are caused by air traffic congestion or, in some instances, last minute adverse weather conditions. They are therefore a measure of the adequacy of airport and air traffic control infrastructure and procedures. They cannot be related to the on-time performance indicators discussed earlier which are a measure of the total delay incurred by RPT aircraft and which allow a 15-minute grace period.

Figure 7.8 depicts the average congestion delay during the peak morning and evening periods at Kingsford-Smith Airport for the December 1990 to June 1992 quarters. Average aircraft delays due to air traffic congestion remained relatively constant following deregulation. Quarterly average delays fluctuated within a two-minute band during evening peak hours and within a three-minute band during morning peak hours over the October 1990 to June 1992 period.

It is concluded that the aircraft handling infrastructure and air traffic control facilities and procedures at Kingsford-Smith Airport coped with the increased demand in the post-deregulation period to mid 1992.

However, even though there had been no large increase in average congestion delays, industry sources indicate that air traffic congestion at Kingsford-Smith Airport is a problem, and a major cause of delays and inefficiency throughout the domestic airlines' operations. A study conducted by the Orient Airlines Association (1992) for the year ending 31 March 1992 found that Kingsford-Smith Airport is congested. This was in spite of the fact

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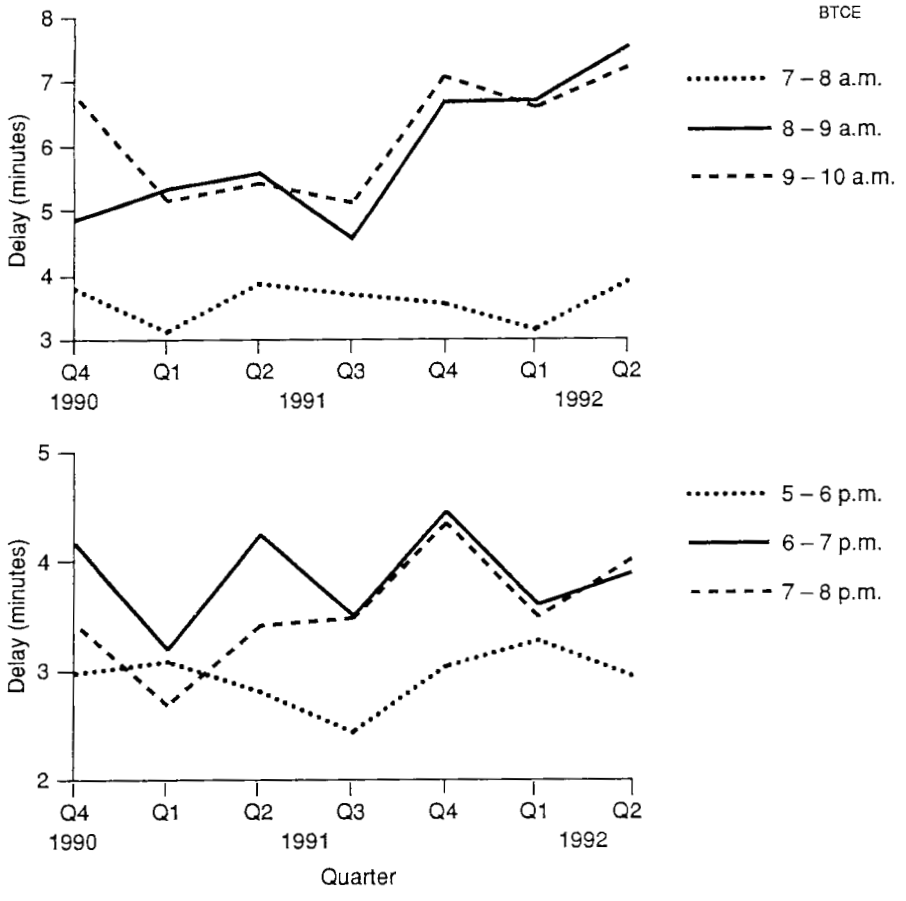
6. An arriving aircraft is delayed when there is a difference between the estimated landing time of the aircraft with no air traffic control intervention and the actual landing time. A departing aircraft is delayed when there is a difference between the time taken from commencement of taxiing to becoming airborne, compared with a standard unimpeded taxi time calculated for the given parking area and runway intersection combination used.



Source DTC (from CAA flow management database).

Figure 7.8 Average aircraft delay due to air traffic congestion at Kingsford-Smith Airport, for morning and evening peak periods

that it ranked third out of ten major airports in the Asia–Pacific region for on-time departures.

Passenger processing facilities

Passenger movements through airports can be separated into four streams:

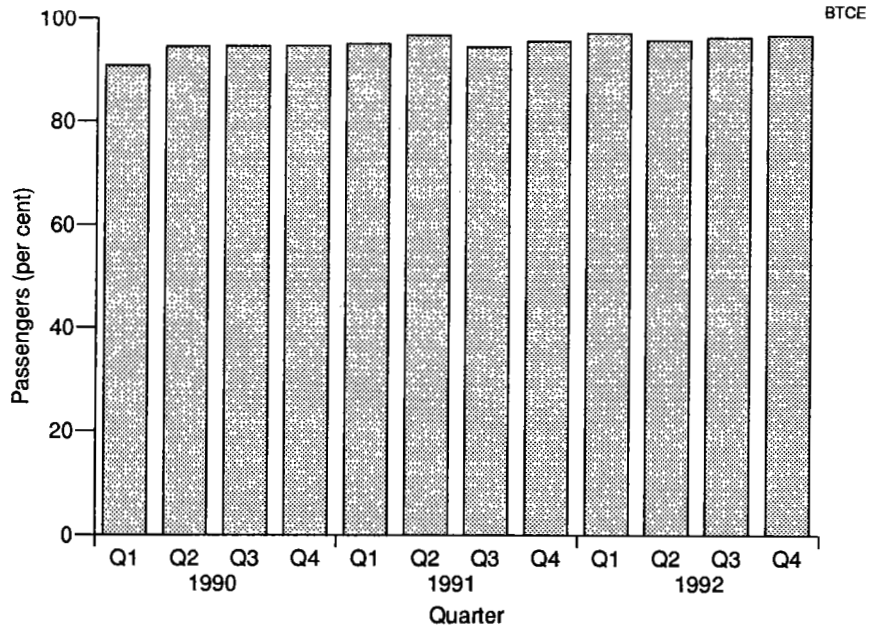
- arriving international passengers;
- departing international passengers;

- arriving domestic passengers; and
- departing domestic passengers.

At the time of writing, indicators could not be compiled for delays experienced by outbound international passengers, or by arriving and departing domestic passengers. The only data which were publicly available related to arriving international passengers. Indicators of delays experienced by these passengers are discussed below.

The Australian Customs Service (ACS) has responsibility for primary processing of all international passengers (including immigration and quarantine clearance for most passengers). Inwards passengers generally join only one queue for customs, immigration, and quarantine processing. Only a small percentage of passengers, usually those whose circumstances are not straightforward, are required to undergo additional clearance procedures.

Having only one agency clearing the vast majority of inbound passengers facilitates the collection and compilation of data on passenger processing delays. ACS has established a target rate of 95 per cent of passengers



Source Australian Customs Service

Figure 7.9 Percentage of passengers processed through customs in less than 30 minutes

TABLE 7.3 PERCENTAGE OF PASSENGERS PROCESSED THROUGH CUSTOMS IN LESS THAN 30 MINUTES

(per cent)

	1990				*1991*				*1992*			
Airport	*March*	*June*	*Sept.*	*Dec.*	*March*	*June*	*Sept.*	*Dec.*	*March*	*June*	*Sept.*	*Dec.*
Sydney	91.7	95.6	93.5	95.0	95.1	97.1	94.7	96.4	97.7	95.9	97.2	97.4
Melbourne	91.3	93.3	97.2	95.9	95.6	97.7	95.5	95.9	97.8	96.3	96.5	96.6
Brisbane	92.3	93.6	93.2	93.5	94.0	96.8	93.8	94.4	95.1	93.9	93.9	96.1
Cairns	89.8	93.0	94.6	95.7	97.4	97.1	94.1	95.9	97.5	97.3	96.0	94.0
Townsville	96.4	94.7	90.2	98.5	86.1	99.9	..	..	..	..	..	..
Perth	85.4	96.6	95.7	92.0	96.5	94.2	93.1	94.2	97.1	97.2	96.2	97.0
Adelaide	92.9	93.4	96.1	95.4	94.3	95.3	94.0	94.4	99.1	96.6	97.1	98.8
Hobart	97.9	97.5	93.7	92.7	87.7	97.4	94.8	97.9	97.7	93.5	97.4	84.6
Darwin	88.3	87.9	94.3	93.9	95.2	95.6	95.5	95.5	95.0	94.5	97.0	96.2
Average	90.8	94.5	94.6	94.7	95.2	96.8	94.5	95.7	97.2	95.9	96.4	96.8

.. Figures no longer kept for Townsville

Source Australian Customs Service.

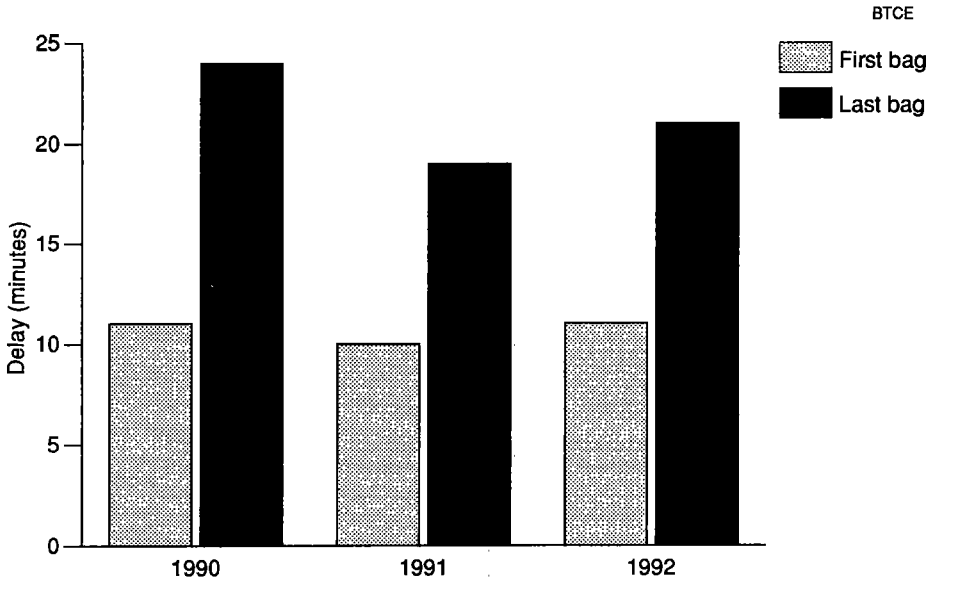
TABLE 7.4 TIME REQUIRED FOR THE FIRST AND LAST BAGS TO BE DELIVERED FROM INTERNATIONAL FLIGHTS

(minutes)

	1990		*1991*		*1992*	
Airport	*First bag*	*Last bag*	*First bag*	*Last bag*	*First bag*	*Last bag*
Sydney	15 (14)	38 (35)	13 (15)	30 (33)	15	32
Melbourne	14 (12)	31 (26)	12 (12)	25 (30)	13	26
Brisbane	9 (10)	20 (20)	7 (9)	9 (18)	10	19
Perth	9 (8)	21 (23)	8 (10)	21 (24)	6	20
Adelaide	11 (11)	20 (25)	10 (11)	20 (22)	11	20
Cairns	14 (11)	21 (19)	10 (8)	15 (11)	9	16
Darwin	12 (12)	21 (20)	12 (13)	15 (15)	15	20
Hobart	7 (10)	20 (25)	7 (10)	19 (22)	8	18
Average	11 (11)	24 (24)	10 (11)	19 (22)	11	21

a. Surveys are undertaken in May and November each year. Figures in brackets are for November. There was no survey in November 1992.

Source Australian Customs Service.



Source Australian Customs Service.

Figure 7.10 Time required for the first and last bags to be delivered from international flights

cleared within 30 minutes. Processing rates are monitored by the ACS and sufficient resources are allocated to meet the target rate under normal circumstances.

Table 7.3 and Figure 7.9 show the percentage of passengers processed through the entry control point in under 30 minutes at Australia's international airports. There was an overall improvement in the percentage of passengers cleared through the entry control point in less than 30 minutes in 1991 and 1992 when compared to 1990. It was therefore concluded that the level of service and infrastructure available for clearing inwards passengers coped with the increase in demand over the study period.

ACS also conducts a survey of baggage processing rates (although facilities for baggage processing are part of the airport infrastructure and individual airlines are responsible for the provision of baggage handling labour). The standards set for baggage delivery are first bag to be delivered within 15 minutes of arrival at the terminal and last bag to be delivered within 35 minutes. Data for 1990, 1991 and May 1992 are presented in table 7.4 and May survey data are charted in figure 7.10. The data show that the standards set by ACS were being met and baggage delivery times had not deteriorated over the May 1990 to May 1992 period.

CONCLUSIONS ON SERVICE QUALITY

Based on the data available it was concluded that there was an overall improvement in the quality of service provided to passengers by the RPT aviation industry in the post-reform period to the end of 1992. Quality of service improved in three key aspects:

- the frequency of services provided by the domestic airlines;
- the level of non-stop services; and
- the airlines' on-time performance.

For the remaining key aspects of service quality (that is, safety, passenger accessibility to the RPT network, service provided at airports, and service and comfort on board) it was concluded that service quality had been maintained over the study period.

The results of the study indicate that the aviation reform objectives, of fostering increased competition and responsiveness to consumer needs, were being achieved in regard to the quality of service provided by the RPT aviation industry.

However, further improvements in quality of service are possible. As at the time of writing, a number of reform measures were under way which will continue to have an effect on the quality of service provided to passengers.

Although Compass Airlines has ceased operations for the second time, the merging of Qantas and Australian Airlines, implementation of a single trans-Tasman aviation market, and granting of domestic carriage rights to Air New Zealand should ensure vigorous competition in the domestic air passenger market. In addition, the announced program to construct common-user terminals at key airports will remove a major barrier to entry to the industry. Infrastructure improvements such as the third Sydney runway should enhance the on-time performance of RPT carriers. Improvements to air traffic control systems and procedures, including the installation of an advanced air traffic system by 1997, should ensure that there will be adequate capacity to handle any increase in demand with no decrease in safety.

It is considered that the continuing program of aviation reform in Australia will ensure that standards of service quality provided to air passengers will not only be maintained but will improve in future years.

PART III: PERFORMANCE

CHAPTER 8 INDUSTRY AND AIRLINE PERFORMANCE

The two previous chapters presented changes to industry performance mainly from the outlook of the consumer, namely, what happened to prices and service quality? In this chapter we present a number of simple measures of industry performance, mainly from the viewpoint of the industry and the economy as a whole.

PERFORMANCE MEASUREMENT ISSUES

Performance measurement, besides being important to owners and managers, is important for evaluation of public policy towards the airline industry as well as an adjunct to further policy formation.

A suite of performance measures is generally required, as no single measure of industry performance is entirely satisfactory. This is partly because there are a number of performance aspects of interest. Besides prices and service quality, as discussed in earlier chapters, in this chapter we examine growth rates, profitability, allocative efficiency, market and modal shares and propensities to travel.

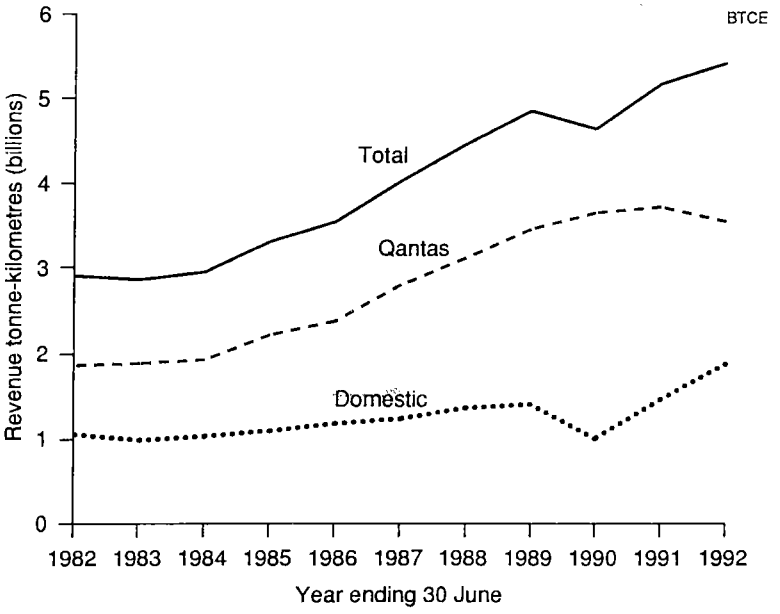
In addition, various individual statistics can give a misleading impression as to overall performance. For example, comparisons of cost per passenger-kilometre figures, among airlines, should be corrected for the differences in cost economies which the airlines enjoy on account of differences in stage length and traffic density. Similarly, performance comparisons between airlines of different countries should be corrected for differences in costs of inputs. Productivity comparisons among airlines should be tempered by allowances for differences in service quality characteristics which affect an airline's revenue earning power. A high cost airline can be an even higher revenue earner. These considerations should be borne in mind when interpreting the available evidence on airline and industry performance.

GROWTH IN INDUSTRY OUTPUTS

Revenue tonne-kilometres

A primary measure of gross output performance by the airline industry is revenue tonne-kilometres (RTK). RTK is the sum of the products of the weights of passengers, freight and mail carried multiplied by their respective distances, and is one way in which the provision of different types of services by the airline industry may be combined into one statistic. Figure 8.1 shows growth in RTK for the Australian airline industry over the ten years 1982 to 1992.[1]

Using RTK as a measure, three separate phases may be observed in industry output performance over the last ten years. The earlier years, 1982–83, were marked by static output due to an Australian and world recession. In the mid 1980s up to 1989 Qantas grew strongly, and domestic aviation grew steadily. Qantas, in particular, was greatly assisted by, and assisted, an upsurge of inbound tourism. The last few years are less easily categorised. There was a



Note 1992 output is estimated.

Sources DTC, Qantas Annual Reports.

Figure 8.1 Australian airline industry output

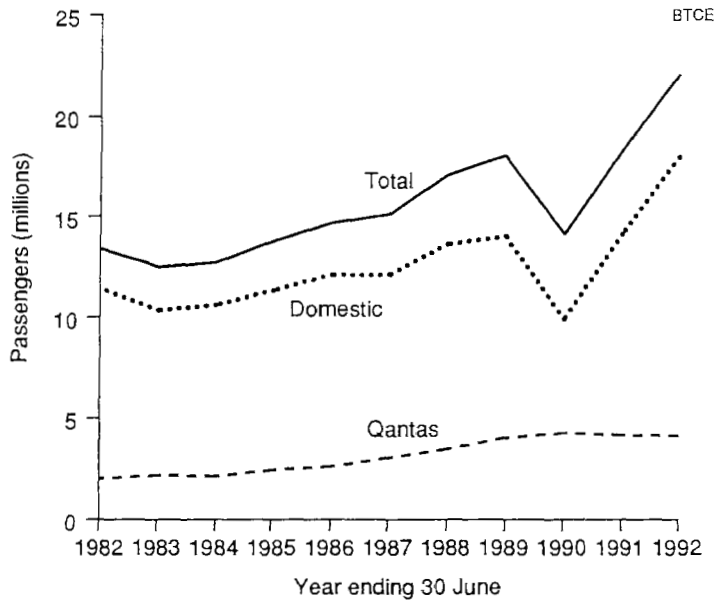
1. Data on revenue tonne-kilometres performed are shown at appendix table III.1.

dip in output in 1990 which was caused by the domestic pilots' dispute. In 1991, Qantas output was reduced below what it might have been, on account of the Gulf war and, in 1992, by the onset of the 1992 world depression. Domestic output was strong in 1991 and 1992 due to the stimulative effects of deregulation.

RTK however, can be a misleading statistic. RTK gives equal weighting to services of differing values. There may be large differences in the value per tonne-kilometre among passenger, mail and freight carriage and within each category of service (for example, first, business, full economy and discount passengers). In part this deficiency can be remedied by referring separately to statistics on carriage of passengers, freight and mail and to industry sales revenue data.

Passenger numbers

Examination of the numbers of passengers carried between 1982 and 1992,[2] as shown in figure 8.2, reveals similar trends in performance to RTK data,



Sources DTC, Qantas Annual Reports.

Figure 8.2 Airline passengers

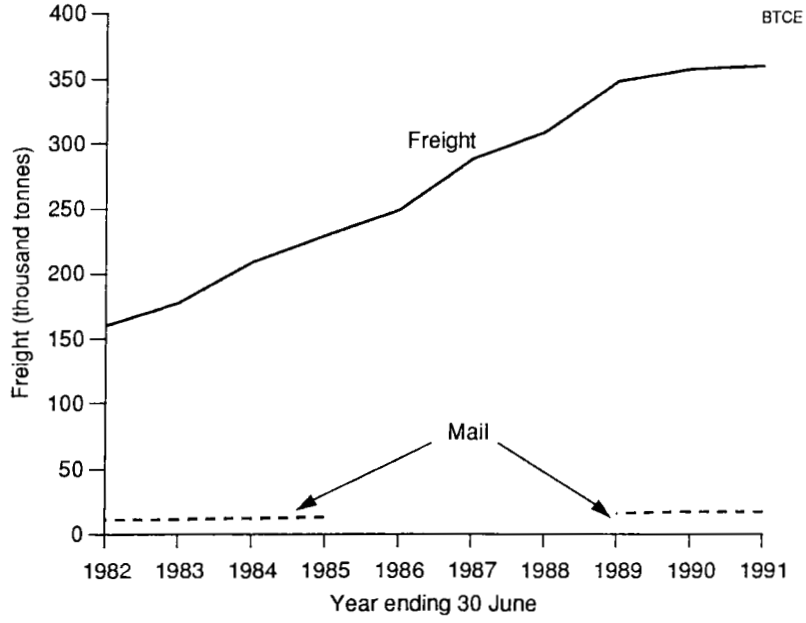
2. Data on airline passengers are shown at appendix table III.2. Revenue passenger-kilometre and available seat-kilometre data for domestic airlines are shown at appendix table III.8, but do not add significantly to the information already discussed.

except that, because Qantas is a long-haul airline, on a RTK basis it has a far higher output relative to the domestic airlines than on the basis of passenger numbers.

Carriage of freight

The available data on carriage of domestic air freight are not comprehensive. Data coverage only extends to freight carried in the bellyholds of scheduled domestic passenger services and some freight carried by scheduled domestic air freight operators. Thus not all freight carried by scheduled domestic air freight operators is included. Moreover, during the 1989 pilots' dispute Ansett transferred a considerable amount of freight from passenger to freight specific services, for which they do not provide figures, so the data are distorted over time. For these reasons the available data are not analysed here.

International freight to and from Australia has more than doubled in ten years, from 160 000 tonnes in 1982 to 360 000 tonnes in 1991 (figure 8.3). About 36 per cent of freight by volume is carried by Qantas.



Note Data on mail unavailable 1986 to 1988.

Source DTC.

Figure 8.3 International air freight and mail to and from Australia

International mail carriage has increased at a slower rate, increasing by 50 per cent from 11 000 tonnes in 1982 to 17 000 tonnes in 1991. Qantas holds a 42 per cent share of this market by volume.

FINANCIAL PERFORMANCE

The profitability of the airline business in Australia has long been finely balanced (due in part to the nature of the business, with very high capital expenditures in providing carrying capacity and relatively low marginal costs in making surplus capacity available to additional passengers). Profitability has generally been moderate. Figures 8.4 to 8.6 show revenues, costs and operating profits for the Ansett, Australian and Qantas Groups for the financial years 1982 to 1992.[3]

Ansett managed to achieve a faster growth in revenues relative to costs from about 1984 onwards, with favourable effects on its balance sheet until the pilots' dispute in 1989 sent earnings into a nosedive and resulted in a serious loss of profitability. This was followed by domestic deregulation and a recognition by airlines that better management of yields and rationalisation of costs were required for profitability in the new competitive environment. On the figures publicly available at time of writing, Ansett had yet to regain overall profitability.

For Australian Airlines, the story was similar to Ansett's, except that the period over which it managed to achieve earnings growth significantly in excess of costs was limited to a shorter period in the mid 1980s (but it recovered better in 1990–91).

Qantas' financial performance was uneven also. In the early 1980s, for example, it was able to constrain growth in costs and increase revenues to attain reasonable profitability, but there was some backsliding in 1986, followed by a period of growth in revenues which more than offset growth in costs. Qantas' profits were reduced by the pilots' dispute in 1989, followed by the Gulf War and international recession.

However, more relevant than absolute data for the purpose of assessing airline financial performance are the relative results shown by various rates of

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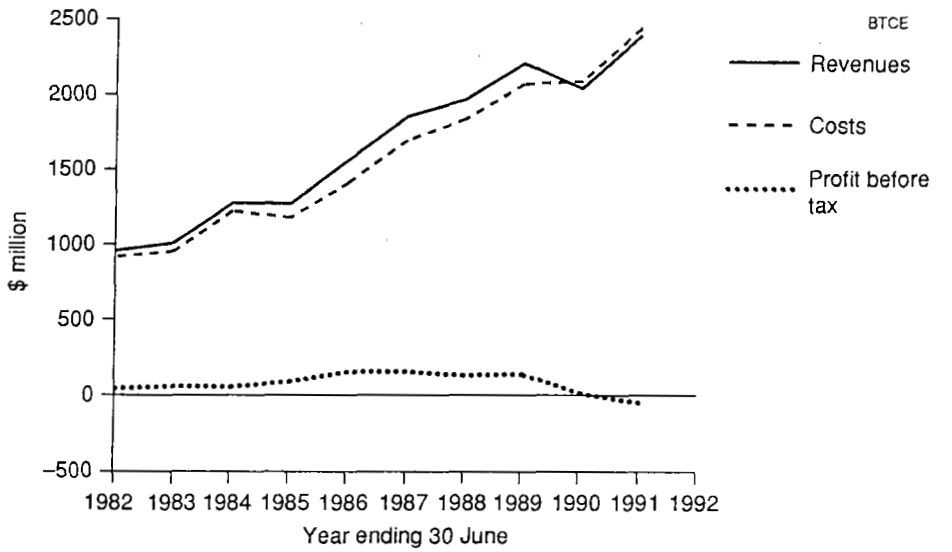
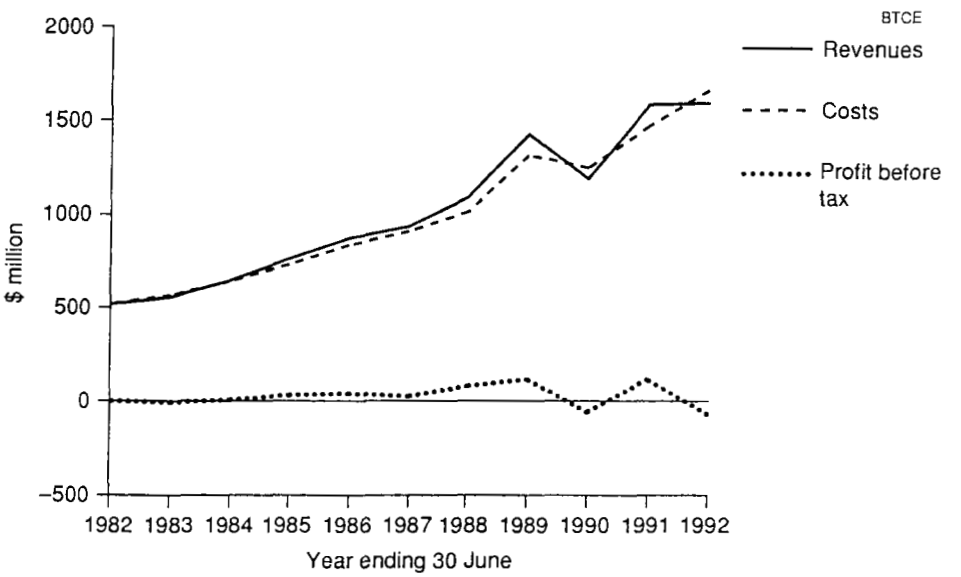
3. More detailed financial data for the airline groups Ansett, Australian and Qantas are at appendix tables III.10 to III.12. It should be noted that the figures and tables do not represent the performance of the airline industry alone. As was shown in chapter 3, each of these companies derives incomes from other activities besides the airline business to varying degrees. The most diversified is the Ansett Group, with approximately 40 per cent of its interests outside aviation and airline interests in three countries. Therefore reported figures are not directly related to the financial performance of airlines, particularly Ansett Airlines of Australia.



Note Excludes abnormal and extraordinary items shown in company balance sheets. Profits are before income tax payments (credits).

Sources Annual Reports.

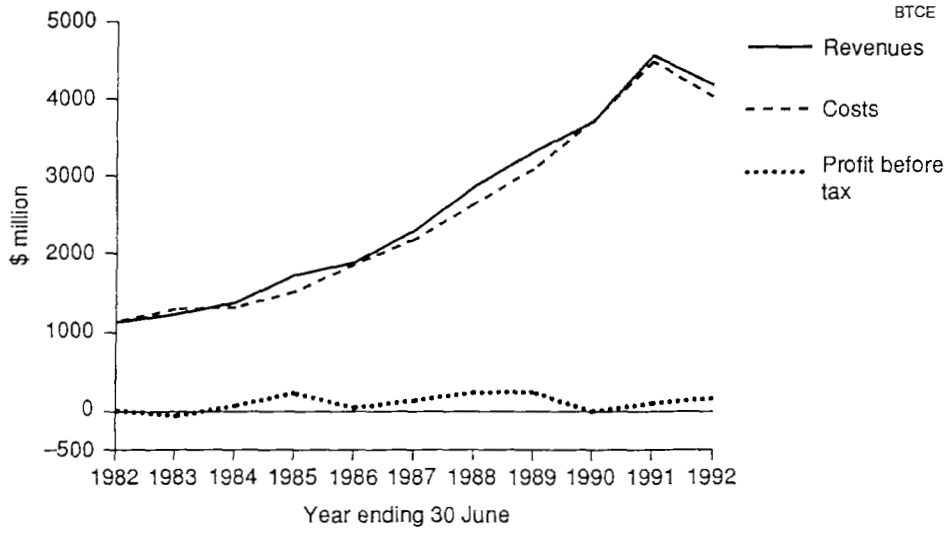
Figure 8.4 Ansett Group revenues, costs and operating profits



Note Excludes abnormal and extraordinary items shown in company balance sheets. Profits are before income tax payments (credits).

Sources Annual Reports.

Figure 8.5 Australian Airlines Group revenues, costs and operating profits



Note Excludes abnormal and extraordinary items shown in company balance sheets. Profits are before income tax payments (credits).

Sources Annual Reports.

Figure 8.6 Qantas revenues, costs and operating profits

return. Perhaps the best indication of the enterprise's asset use efficiency is the ratio of earnings before interest and tax (EBIT) to total assets. These ratios for Ansett, Australian and Qantas for the financial years 1982 to 1992 are shown in table 8.1. These data update the more detailed analysis carried out by BTCE (1990). It should be noted that abnormal and extraordinary revenue items have made a positive contribution to airline profits more often than not over the last ten years. One of the reasons for this string of positive abnormal revenue items was that Australian-domiciled airline companies have an excellent record for aircraft maintenance and have therefore commanded good resale values for their surplus aircraft. However, the airlines cannot be sure of commanding the advantageous resale of surplus aircraft in the near future given the depressed state of world airline and aircraft markets.

Table 8.1 tells a complex story. Ansett's financial performance after 1982 was good to very good until the 1989 pilots' dispute and the advent of deregulation. Australian Airlines' performance started at mediocre but improved to match that of Ansett before it experienced a similar experience to Ansett subsequent to 1989. Qantas' financial performance was poor, showed improvement in the mid 1980s, hit another bumpy patch with the pilots' dispute followed by the Gulf War, but again showed improvement in financial year 1991–92. Generally, however, the major Australian airlines were showing at least

TABLE 8.1 RATIO OF EARNINGS BEFORE INTEREST AND TAX TO ASSETS

(per cent)

Financial year	*Ansett*	*Australian*	*Qantas*
1981–82	10	5	3
1982–83	10	4	(5)
1983–84	18	5	10
1984–85	11	9	20
1985–86	13	9	3
1986–87	13	5	8
1987–88	13	9	10
1988–89	6	11	7
1989–90	7	1	3
1990–91	(0)	11	5
1991–92	1[a]	1	6

Note Numbers in brackets are negative.

a. Estimate.

Source Airline Annual Reports.

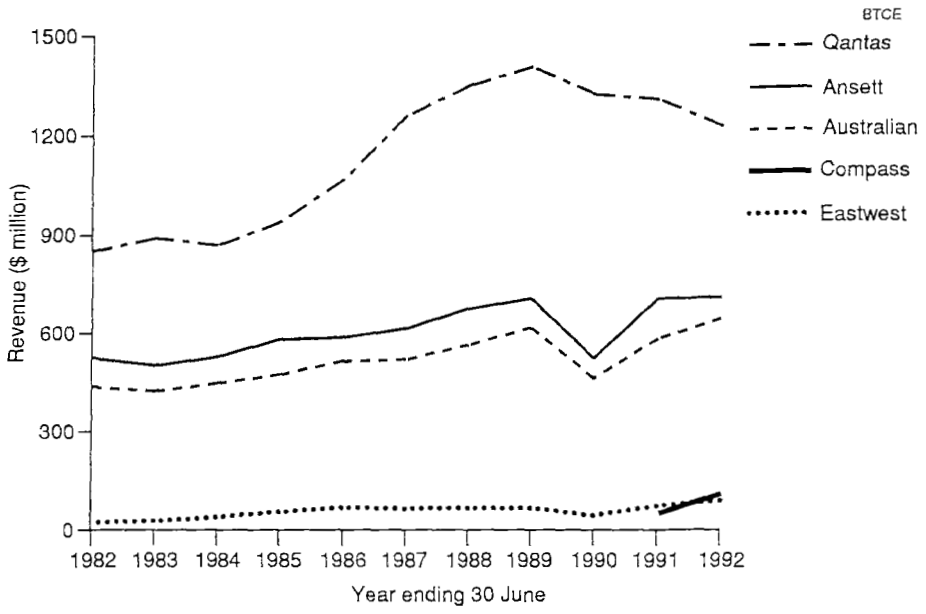
positive economic rates of return as measured by earnings before interest and tax.

More comprehensive reports on Qantas' and Australian's financial performance (for example, BTCE 1990 and Industry Commission 1990) have argued that their real rates of return on assets were consistently below a benchmark rate of around 8 per cent. The benchmark was indicative of the opportunity cost of capital (for example, relative to what investments could yield in the private sector). The present analysis indicates that none of the airlines have since met this benchmark.

But things have changed. These reports were made towards the end of an economic boom, and at the beginning of Australia's aviation reforms. Therefore, it has been made much more difficult for airlines to meet these previously established benchmarks. Probably also private industry performance has declined commensurately in the recession and a lower opportunity cost benchmark might be considered appropriate in the short term.

Notwithstanding these considerations, however, it is well known that profitability is of major concern to all the airlines in the industry at present and that either costs must be pruned or revenues must be increased to redress the imbalance between revenues and costs.

Compass Mk1 made a loss of $45 million on a going concern basis (a loss of $126 million if the business had been wound up) in the half year to December



Note Based on 1982 dollars.

Sources IAFC, ABS, BTCE estimates.

Figure 8.7 Real passenger revenues

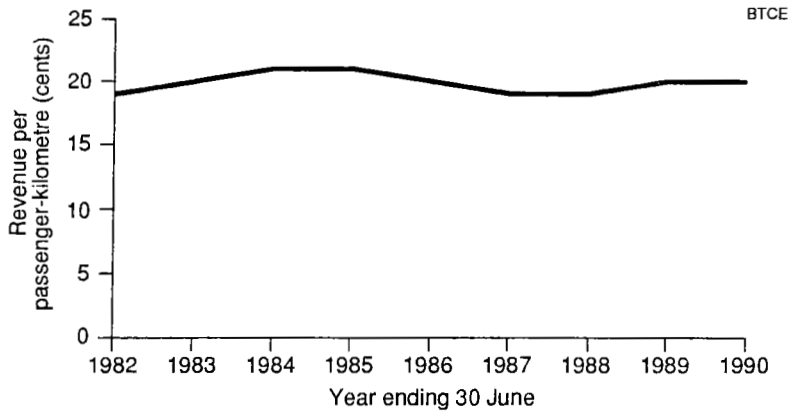
1991 (Ferrier Hodgson & Co. 1992). This was on revenues of $97 million. Compass Mk2 made an interim loss of $10.95 million in its first four months of operations (see detailed analysis in chapter 5).

Eastwest was estimated to have lost about $62 million in the 1991–92 financial year on estimated revenues of $185 million.

It is also instructive to consider real airline revenues as an indicator of airline industry earnings. BTCE estimates of real passenger revenues are shown in figure 8.7.[4] The major difference to emerge when industry performances are measured on the basis of real passenger revenues is that the growth (if any) in real revenues of the domestic airlines has been significantly lower than growth in physical outputs.[5] This may be indicative of some underlying improvement

4. Estimated as the product of average air fares and numbers of passengers. Data on nominal and real passenger revenues and the price deflator used, the consumer price index, are shown in appendix tables III.3 and III.4.

5. For all the airlines, real revenues were reduced during the pilots' dispute in 1989–90 but domestic airline revenues have subsequently recovered to approximately the previous trend rate of growth.



Note Based on financial year 1991–92 dollars.

Sources IAFC, ABS, BTCE estimates.

Figure 8.8 Domestic airline real passenger revenues per passenger-kilometre, 1981–82 to 1989–90

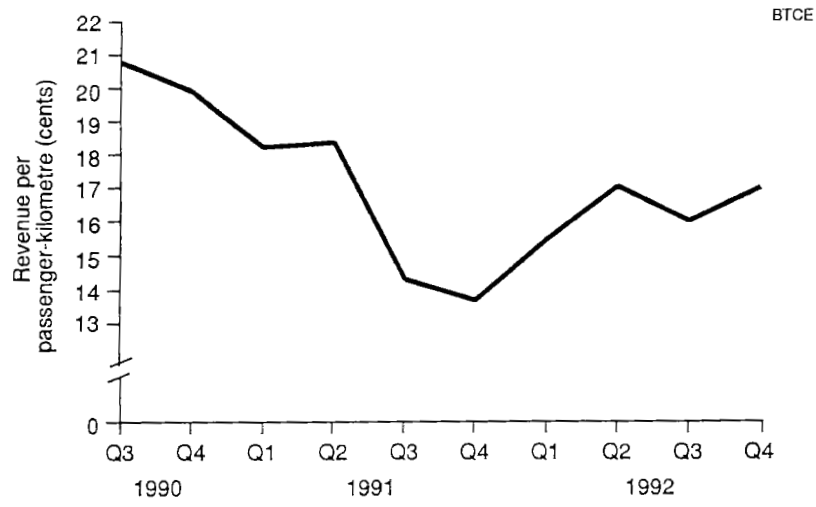
in total factor productivity despite the fact that costs have been, in general, also growing faster than revenues. However, more data and analysis are necessary for definitive conclusions.

Revenues per kilometre delivered are further indicators of performance for individual categories of service such as carriage of passengers. Figure 8.8 illustrates the average domestic airline passenger-kilometre revenue earned during the period 1981–82 to 1989–90.[6]

Had the previous trend continued, where average domestic airline fares closely emulated consumer price index movements, the more or less constant level of real domestic airline revenues might have been expected to continue. However, this was not what occurred after deregulation. As shown in figure 8.9, real average revenues[7] departed markedly from this previously established trend, dropping from around 21 cents per passenger-kilometre in the September quarter 1990 to bottom out at just under 14 cents per passenger-kilometre in the December quarter 1992. Real average revenues then rose to 17 cents per passenger-kilometre in the June quarter 1992. The

6. Based on Independent Air Fares Committee determinations over this period. During the 1980s the IAFC determined air fares under the charter of enabling airlines to cover costs and make 'reasonable' profits.

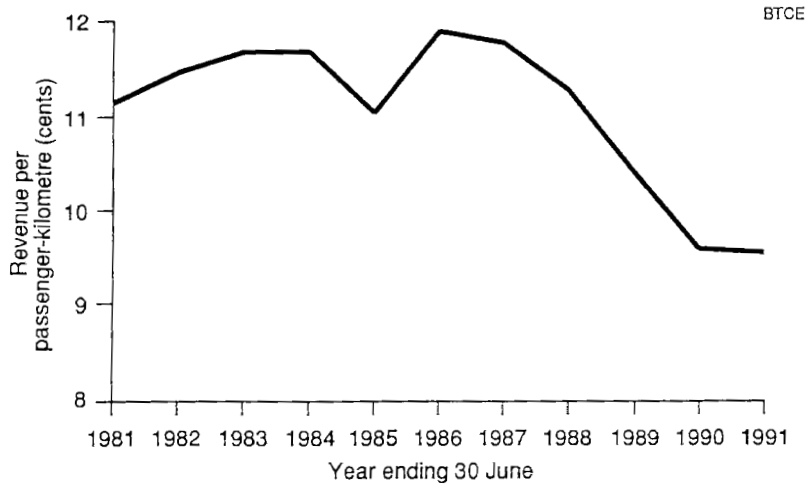
7. Estimates based on Prices Surveillance Authority data for the 18 main interstate routes, which is a reasonable proxy for the network as a whole. Real revenues are measured in June quarter 1992 dollars.



Note Based on 1992Q2 dollars.

Source PSA.

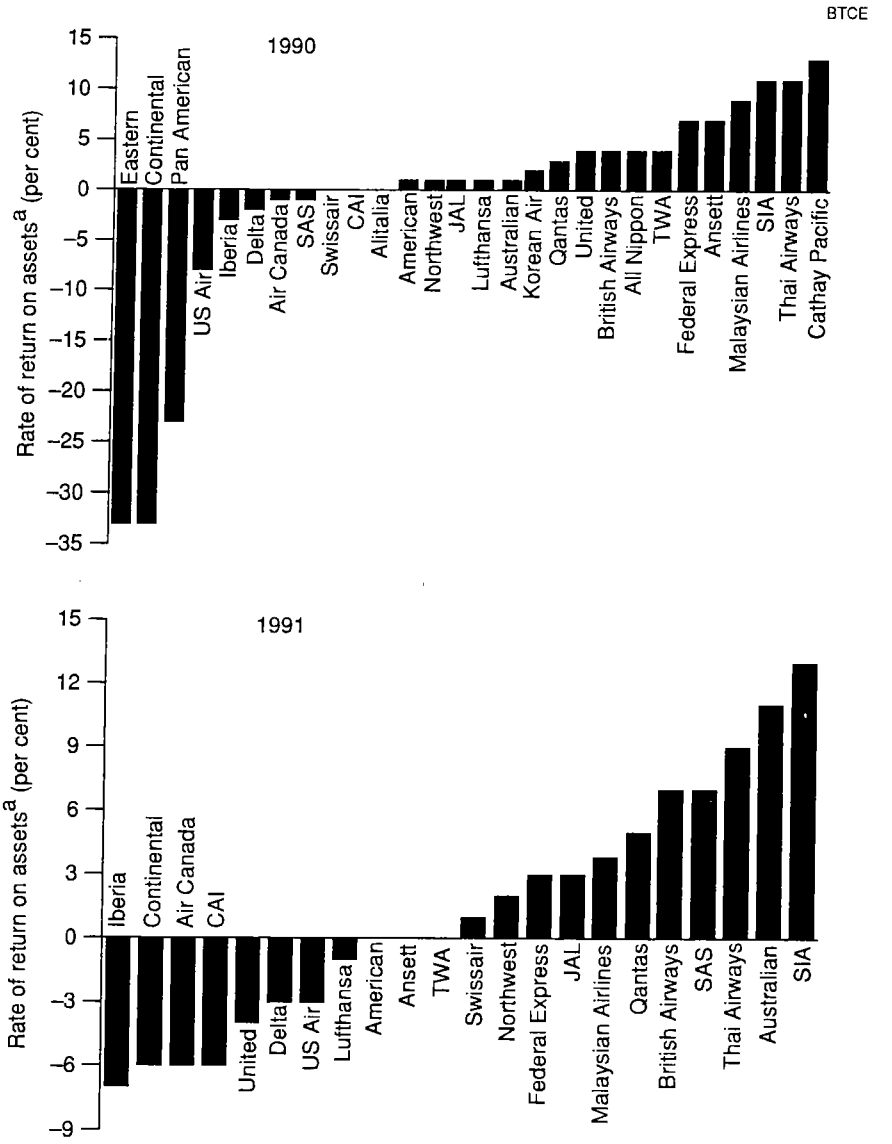
Figure 8.9 Domestic airline real passenger revenues per passenger-kilometre since deregulation



Note Based on financial year 1991–92 dollars.

Sources Qantas Annual Reports, ABS.

Figure 8.10 Qantas real passenger revenues per passenger-kilometre



a. Earnings before interest and tax, excluding some extraordinary items where disclosed, as a percentage of total assets.

Sources ICAO, airline Annual Reports.

Figure 8.11 Australian and overseas airline rates of return[a]

bottom line is that domestic airline revenues have dropped by about 20 per cent in real terms since deregulation.

Qantas real passenger revenues per passenger-kilometre are shown in figure 8.10.[8] Revenues increased slightly up to 1985–86 and have subsequently declined. Remarkably, the reduction in Qantas' real revenues since 1986 was nearly 20 per cent, which is a figure which was suggested by the Industries Assistance Commission (IAC 1989) as being how much revenues and fares could be reduced if Qantas were subjected to increased competition. There was some evidence of increased competition for Qantas, which is discussed later in this chapter.

Comparisons of airline profitability

There have been a number of warnings about the difficulties of making meaningful comparisons of profitability among airlines because of variations in accounting practices and disclosures, but unfortunately there has been little guidance, and even less data, on how to correct for such problems.[9] Accordingly, some caution is called for regarding the robustness of any conclusions drawn about relative profitability.

Australian-domiciled airline companies were achieving middle to upper-ranking rates of return on assets when compared with rates of return for the major world airlines in financial years 1989–90 and 1990–91[10] as shown in figure 8.11 and appendix table III.15. United States companies were outstandingly bad loss makers, and the airlines of our near Asian neighbours, such as Malaysian, Thai, Singapore and Cathay Pacific, were consistently good financial performers. It is important to our future competitiveness that we match the financial performance of the airlines in whose markets we will be competing.

EFFICIENCY

Costs relative to capacity

A simple measure of efficiency in delivering a given level of output is cost per tonne-kilometre available, as shown in figure 8.12. However, as a measure it has its deficiencies because:

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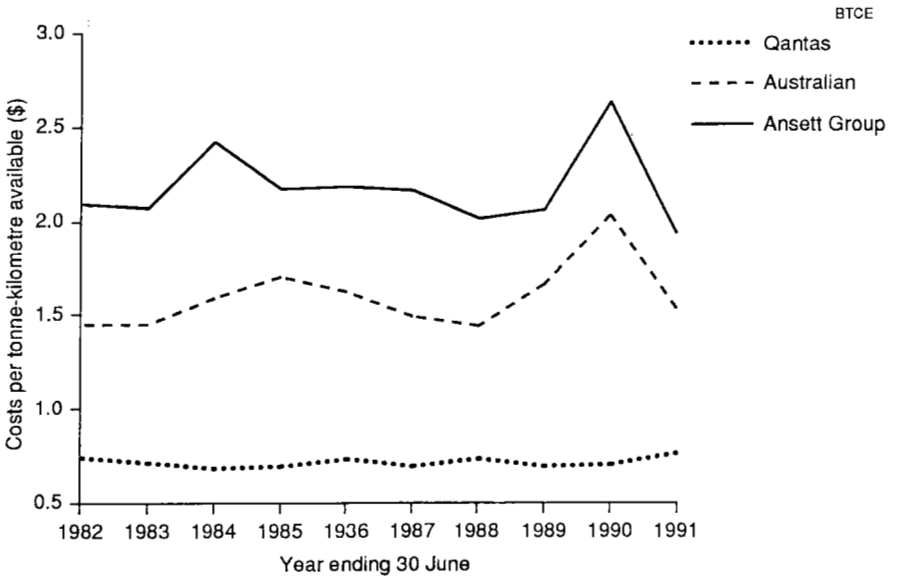
8. Data on Qantas revenues and performance are shown at appendix table III.5.
9. See, for example, 'The mysterious world of airline accounts', *Avmark Aviation Economist*, October 1992, p.8; 'Making sense of accounts', *Avmark Aviation Economist*, November 1992, p.13; and, 'Performance and rates of return', *Directions in Government*, December 1992/January 1993, p.11.
10. The most recent year for which comparable data were available.

- the airlines produce a range of outputs including some outside the airline business (as mentioned above);
- there are differences in operational characteristics and input costs among airlines which are not under airline control; and,
- airline outputs of disparate values are lumped together into one single measure.

It would only be possible to disentangle the joint costs of producing the range of airline outputs by using a simulation model approach and some rather arbitrary assumptions about shares in overheads. Furthermore, the costs of producing a tonne-kilometre of airline services are overstated to the extent that the costs which are exclusively necessary for the production of other outputs are entangled in the reported figures (particularly in the case of Ansett, as noted in chapter 3).

Thus it would not be appropriate to draw inferences about the relative efficiency of Ansett, Australian and Qantas from figure 8.12. The relatively low cost per tonne-kilometre exhibited by Qantas may be attributable to its long-haul characteristics as well as economies of route density. Similarly, the Ansett Group appears high cost but this could be accounted for by the 40 per cent of its business which was non-airline and its wider domestic network (in



Note Based on financial year 1991–92 dollars.

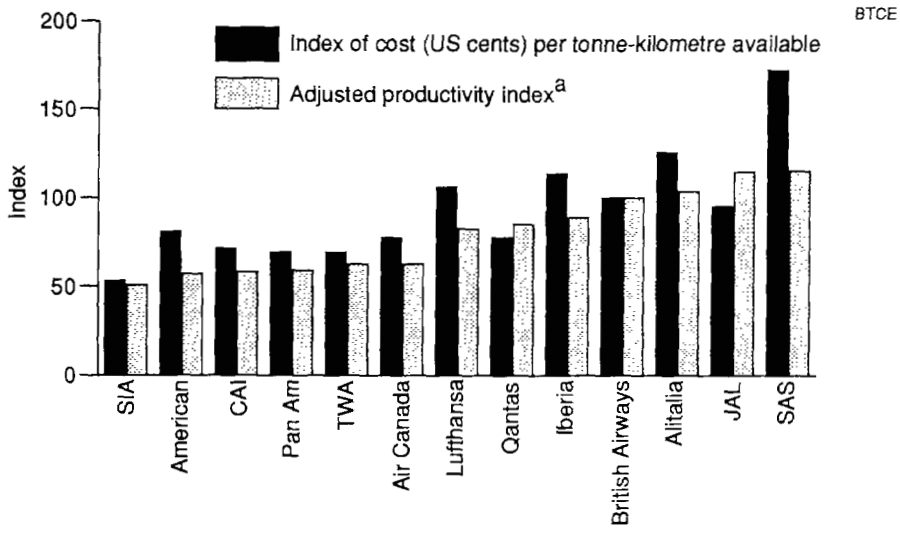
Sources Airline Annual Reports, DTC, ABS.

Figure 8.12 Real airline costs per tonne-kilometre available

particular, its coverage of 'thin' routes in Western Australia). The costs of Ansett's trunk operations were believed to be of a similar magnitude to Australian's.

The per kilometre costs of operating Compass Mk1 were of the order of 40 per cent lower than the estimated average cost for incumbent domestic airlines (but this cost advantage did not translate into higher profitability) (Trade Practices Commission 1992). The costs of operating Eastwest were estimated to have been about 40 to 50 per cent higher than Ansett or Australian in 1990–91, mainly on account of the relatively high costs of operating the BAe146 aircraft. This difference will have narrowed by 1993 on account of the considerable efforts undertaken to cut costs at Eastwest and its sharing of facilities and aircraft with Ansett. Analysis by the BTCE using its Aerocost model indicated that the direct operating costs of Compass Mk2 were not significantly different from Ansett or Australian.

Figure 8.12 does capture, however, the spike in costs attributable to the airline pilots' dispute in 1989–90 and, more subtly, some trends in cost over time. There was no evidence, in the cost figures available to date, of whether



Base: British Airways = 100.

a. The lowest adjusted cost per tonne-kilometre available represents the most productive airline.

Source BTCE estimates from ICAO data.

Figure 8.13 Relative airline productivity, 1990

significant economies had been achieved from recently reported efforts to rationalise operations or use of factor inputs.

Comparisons of efficiency among airlines

The most meaningful measures of overall industry allocative efficiency are, in principle, derived from econometric studies of cost or production functions or measures of total factor productivity. Yet such measures require much data which are not publicly available, are expensive to produce and are difficult for the general public to comprehend. For these reasons we did not attempt to produce such measures in this study. An alternative is to attempt to correct the raw statistics for such biases as are introduced by differing access to aircraft size and route density economies and differences in input costs, along the lines suggested by Forsyth, Hill and Trengove (1986).

In order to arrive at a simple comparative measure of airline productive efficiency, we adopted the method suggested by Forsyth et al. The method constructs a 'productivity index' by adjusting 'cost per tonne-kilometre available' to allow for differences between airline operational characteristics likely to affect output and for differences in input costs between countries. The results of applying the parameters estimated by Forsyth et al. to 1990 data for selected airlines are shown in figure 8.13 and appendix table III.14.[11]

The results, of this admittedly rough and ready approach, are ordered from left to right in terms of decreasing productivity. They suggest that Singapore Airlines (SIA) was the most productive of the selected airlines and SAS (Scandinavia) the least. All the airlines domiciled in North America scored well. Qantas ranked somewhere in the middle. Since 1990, Qantas has made intensive efforts to improve its cost efficiency. It may well have improved its ranking subsequent to the timing of this analysis although other airlines have been equally vigilant to remove unnecessary costs.

A comparison with the original (1983) results derived by Forsyth, Hill and Trengove indicates that Qantas' ranking had improved somewhat, going from 14th to 8th in the efficiency rankings. A number of airlines had disappeared, notably Peoples Express (rated most efficient in 1983) and Pan American.

A recent analysis of Qantas' total factor productivity (Industry Commission 1990) noted that Qantas had been expanding at a rate of 8.4 per cent per year

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11. Considerable work could be done to improve and extend the analysis represented in figure 8.13. For instance, estimates of the relative efficiency of Ansett, Australian and Air New Zealand could be attempted. Moreover, the BTCE costing model, Aerocost, could be used to derive more information on how airline costs are affected by various operational characteristics. Also, more data are now available to adjust airline input costs. However, these refinements were not possible in time for this publication.

from 1981–82 to 1987–88. The contribution of factor productivity gains to this rate of growth was approximately one percentage point per annum over this period. However, no comparisons were made with other airlines and no consideration was given to what growth rates are achievable in the airline industry. Without comparative measurement of Qantas' efficiency or rate of productivity improvement relative to other airlines, it is not possible to determine from these statistics whether Qantas is relatively more or less efficient than other airlines or becoming more or less cost competitive.

A good productivity score is no guarantee of ultimate success or survival, because the measure does not include any weighting for whether the airline is delivering what the customer wants and therefore whether it can maintain a surplus of revenues over costs. Some airlines which appeared to be highly efficient but did not survive were Compass Mk1 and Peoples Express (USA). The common threads between these two airlines appear to be that they were new low cost entrants who experienced rapid expansion before crashing financially, and they both offered relatively low levels of certain key service quality characteristics. Conversely, British Airways and Japan Airlines do not score well on productivity measures, but there is less question about their survival because, as we showed above, they have been reasonably profitable when apparently more productive airlines have not.

Considerable further work is required therefore in order to arrive at a meaningful measure of comparative airline efficiency. Such analysis could be fruitful in gaining a better understanding of the relative importance to allocative efficiency of making an airline cost efficient versus better tailoring of airline services to consumer needs. Airline managers themselves have been experimenting with the balance between the needs to be cost efficient and to be service-oriented in these more competitive times, as evidenced by our analysis of market developments in previous chapters. Further efficiency analysis may be useful for understanding these needs and may also have implications for public policy in airline markets where access is still regulated (for example, international and domestic intrastate) as well as providing a better understanding of what can be expected to eventuate in deregulated markets.

Efficiency gains in the FAC and CAA

As with the reform of domestic aviation policy, one of the major aims behind the reform of Australia's government business enterprises (GBEs) was to ensure that the GBEs provided substantial and growing benefits to the community. Both the Civil Aviation Authority (CAA) and the Federal Airports Corporation (FAC) have had to alter their operations in order to meet the objectives set by the Hawke Government in its reform agenda.

Since taking over responsibility for day-to-day aviation operations in 1988, the CAA has attempted to streamline its operations, seeking to provide only those

services which are essential to the aviation industry and which enhance safety. Following a review of resources and the introduction of a number of efficiency measures, the CAA expects to reduce its operating expenses by around 17 per cent in real terms in the 1992–93 financial year. The CAA announced in April 1992 that these efficiency gains will be passed on to users in the form of a reduction of airway charges. This is anticipated to save the aviation industry approximately $96 million in the 1992–93 financial year. The CAA has been able to reduce its charges in real terms each year since it was established in 1988.

The majority of these efficiency gains have been achieved through the rationalisation of staff numbers. There were over 7300 staff employed by the CAA in January 1991 but by the end of 1992 numbers had been reduced to 5757 and staffing is to be further reduced to 3819 by 1996 (CAA 1992). Any attempt to measure the welfare gains resulting from the GBE reform program in relation to aviation would need to include the costs to the labour market.

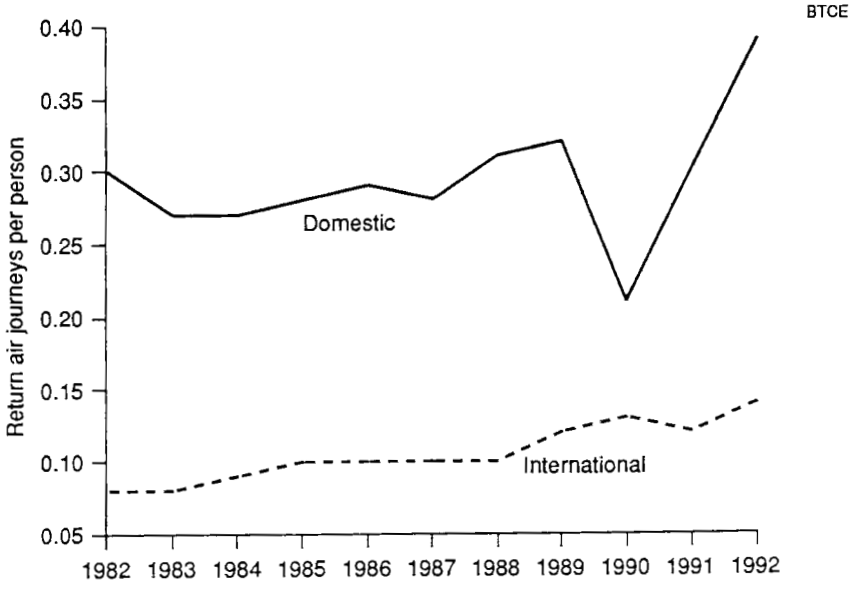
As yet the FAC has been unable to pass on to its users such clear savings from efficiency gains. The FAC, however, has invested around $618 million in capital since commencing operations in 1988 and has still managed to keep increases in aeronautical charges approximately in line with growth in the consumer price index. At the time of publication, there were a number of inquiries proceeding into a range of factors affecting the operation of the FAC. Specifically, the aeronautical and non-aeronautical charges, the valuation of assets and the level of the target rate of return were all being examined. While there is still a question mark over the conditions under which the FAC operates it seems impractical to draw any conclusions as to its performance.

PROPENSITY TO TRAVEL

A further question is whether the apparent improvements in aggregate industry performance and reductions in yields mentioned above represent benefits to Australians. There are potential benefits in the form of increased propensities by Australian residents to travel domestically and overseas and also in the form of increased export earnings to Australia through increases in the number of foreign visitors. Statistics on domestic travel on a per head of population basis and on the number of foreign visitors, depicted in figures 8.14 and 8.15,[12] provide some basis for analysing this issue.

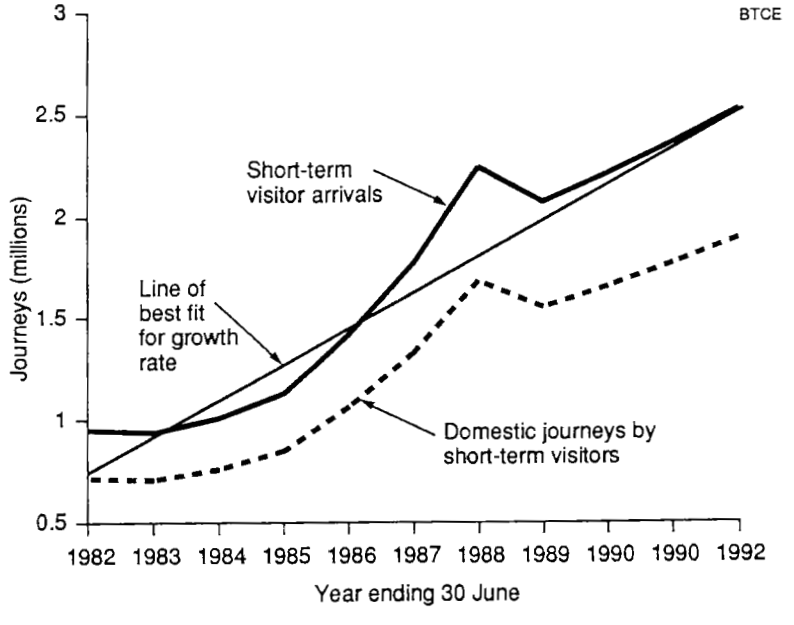
From figure 8.14, it can be seen that Australians were making, on average, about 29 domestic return air journeys per 100 persons each year in the early 1980s. This figure was growing gradually, but increased markedly after

12. Return air journeys are estimated on the assumption that passengers make a return air trip in the same year. Propensity to travel data are shown at appendix table III.6.



Sources ABS, BTCE estimates.

Figure 8.14 Australians' propensity to travel



Sources ABS, BTCE estimates.

Figure 8.15 Travel in Australia by foreign visitors

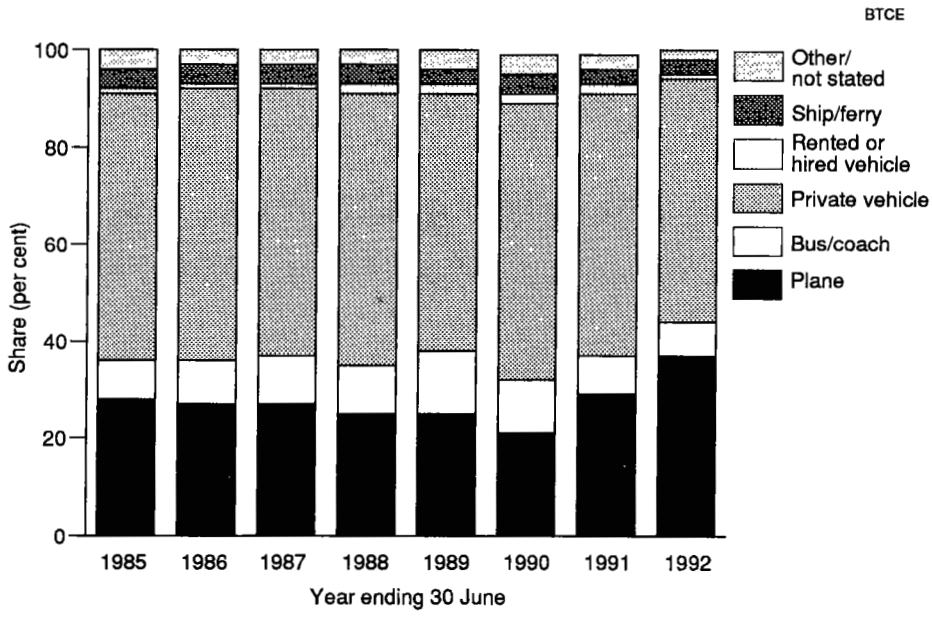
deregulation, with an estimated 39 domestic return air journeys per 100 persons in financial year 1991–92. Of course, some travellers were making multiple journeys, so the number of persons making at least one air journey will be considerably lower than the average number of return air journeys.

International air journeys by Australians, also shown in figure 8.14, have been growing steadily. In the ten years to 1992, international travel has increased by about 75 per cent or from an estimated 8 return journeys per 100 persons in 1982 to 14 return journeys per 100 persons in 1992.

Air journeys by foreign visitors have been growing very rapidly, as shown in figure 8.15. The growth rate in air journeys by foreign visitors is estimated at 12.7 per cent per annum over the 1980s decade, represented by the line of best fit in the chart.

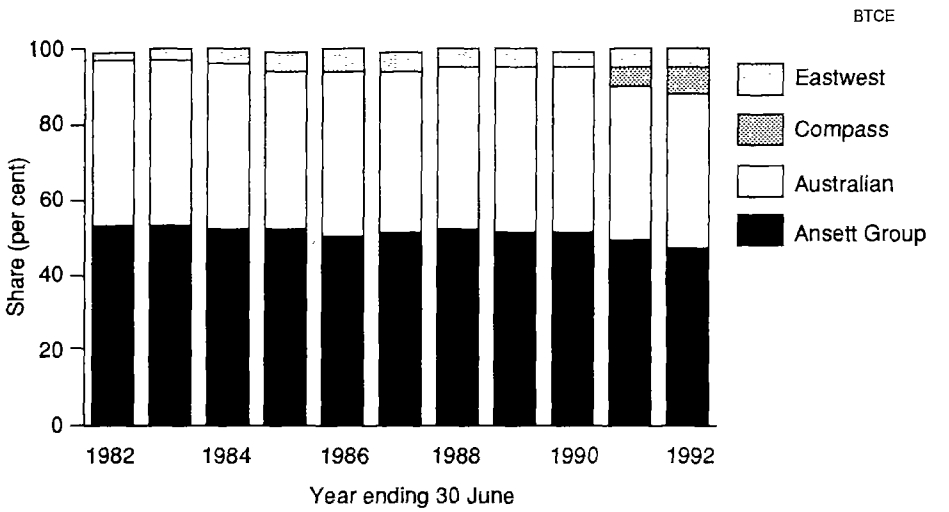
MARKET AND MODAL SHARES

Overall, industry market share performance may be gauged by the share of the airline mode in the number of persons travelling between given origins and destinations. Figure 8.16 shows modal shares of interstate overnight travel for



Source Bureau of Tourism Research.

Figure 8.16 Modal shares of interstate overnight travel



Source DTC.

Figure 8.17 Domestic airlines' market shares, revenue passenger-kilometre basis

the last eight years.[13] It reveals that the domestic airlines lost market share to other modes of travel during the pilots' dispute in 1989–90. However, after deregulation, the modal share held by airlines increased from about 25 per cent, which was the average in the early 1980s, to nearly 37 per cent in 1991–92. This was at the expense of all other modes of transport.

Domestic airline market shares

The market shares of the domestic airlines were highly stable under the two airlines policy, as shown in figure 8.17. This was because capacity and services were regulated. After deregulation Compass Mk1 captured a 10 per cent market share before collapsing. Compass Mk2 was reported to have captured a 5 per cent market share by late 1992.[14]

Qantas' market share (international routes)

Qantas' market share of passenger traffic to and from Australia declined rather sharply in recent years (figure 8.18).

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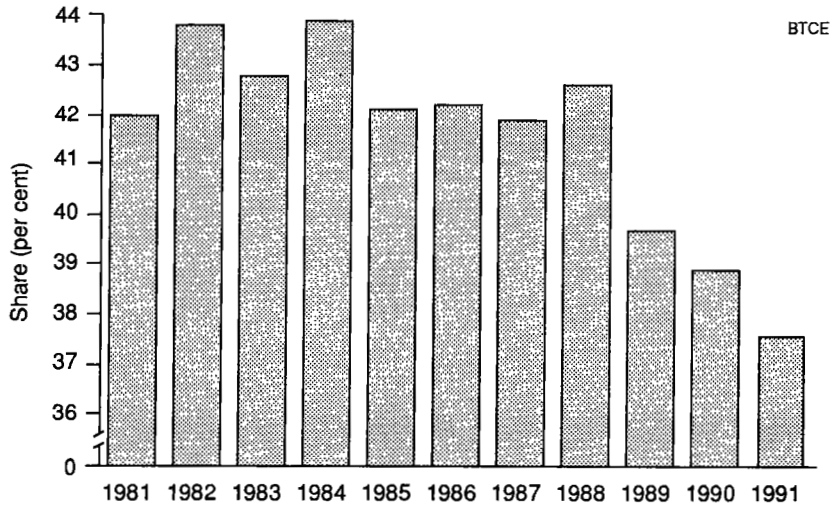
13. Modal share data are shown at appendix table III.7
14. 'Compass is proving to be more than a flight of fancy', *Sydney Morning Herald*, 23 December 1992, p.21.



Source DTC.

Figure 8.18 Qantas' market share of passenger traffic to and from Australia

Any analysis of these figures, however, must bear in mind that the scale might be misleading. For example, if a fall in market share of a few per cent is accompanied by an increase in the level of international competition, then the fall in market share need not be seen as a reflection on Qantas' performance. In addition, not all of Qantas' traffic was Australian origin or destination. There was some evidence that Qantas had become a less parochial airline than formerly and was competing in a wider market than just Australian traffic. In 1991, 61 per cent of Qantas passenger traffic was to or from Australia, compared with 93 per cent in 1981.[15] Data were not available to form a fully comprehensive picture of Qantas' overall share of the markets in which it operated.

Nevertheless, the decline in market share combined with a coincident decline in Qantas' real passenger revenues (figure 8.10) was indicative of a highly competitive market situation for Qantas. Overall, Qantas remained the dominant carrier for traffic to and from Australia, and was the dominant carrier between Australia and Japan and between Australia and the United States. However, it had a lower or close to equal market share compared with other carriers for several individual routes to and from Australia. For instance, in 1991 Air New Zealand held 43 per cent of the Australia – New Zealand market compared with Qantas' 34 per cent. Similarly, Qantas was outweighed by

15. Department of Transport and Communications, *International Air Transport Statistics*, annual.

Cathay Pacific in flights to and from Hong Kong, by Singapore Airlines in traffic to and from Singapore, by Thai International in traffic to and from Bankok, by Garuda in flights to and from Indonesia and by Lufthansa in flights to and from Germany.

CHAPTER 9 WELFARE GAINS FROM DOMESTIC AVIATION REFORMS

The aviation reform measures introduced in recent years have produced a wide range of effects. The size of the market has reached unprecedented highs with more travellers in the air than ever before, despite the economy feeling the effects of a deep recession. Consumers have realised substantial gains from a wide range of deeply discounted air fares. Producers no longer face restrictions of fare based competition or allocation of capacity to particular routes. But what is the total picture? What is the net impact on society of all these changes? This chapter examines the net changes in economic welfare that have come about within the domestic aviation market as a result of the recent aviation reforms, and illustrates how the individual components of welfare change such as increases in quality of service come together to form a total picture of the benefits of market reform.

BACKGROUND TO WELFARE ANALYSIS OF AVIATION REFORMS

In order to determine the net changes in economic welfare it was necessary to go beyond the readily observable phenomena and build a simulation model which adopted a consistent accounting framework and compared actual events with what would have happened if there had been no reform (a 'counterfactual' base).

This is similar to the approach taken by Morrison and Winston (1986) in their evaluation of welfare changes resulting from deregulation of the United States airline industry. However, the approach taken by Morrison and Winston and that adopted in this study differ in two main ways. Firstly, the estimation of welfare gains in the Australian context was undertaken by comparing post-deregulation observations with simulated data for this same period under a continuation of regulation, whereas Morrison and Winston compare actual pre-deregulation observations with data simulating a deregulated market for the period. Secondly, Morrison and Winston use a disaggregate logit model of mode choice for intercity pleasure and business travellers as the basis for calculating travellers' compensating variations (that is, how much money travellers would have to be given after a price or service quality change to be

as well off as they were before the change). This study adopted a somewhat less complex approach by disaggregating the sum of welfare changes and determining values of welfare change in discrete areas such as fare reductions and increased access to direct flights.

Morrison and Winston (1986, p. 51) estimate that deregulation of American domestic aviation led to a yearly welfare gain to travellers and carriers of roughly US$8 billion (1977 dollars). Our study showed that while welfare gains from Australian reform are not of the same magnitude they are nonetheless quite substantial.

In broad terms, the net changes in economic welfare resulting from aviation reforms are made up of changes to consumer surplus, changes to producer surplus, and any net changes to aviation industry externalities.

Changes to consumer surplus result from changes in: air fares; the time between preferred and available departure times; and the availability of direct services. This study examined quarterly changes in these three categories.

Changes to producer surplus include loss of profits due to lower air fares, and any gains resulting from improved labour and operational efficiencies. This study examined quarterly estimates of the profit loss to producers, and subject to data availability, was able to make some tentative estimates of producer gains from cost reductions.

Externalities associated with the aviation industry include: noise pollution; air pollution; congestion in airways, runways, terminals and terminal access routes; and the cost of accidents. Due to data limitations and time constraints this study did not estimate the effect of changes in externalities.

This study was further restricted to a partial equilibrium analysis. Changes in the aviation market would have more general equilibrium implications; however, the constraints of time and data availability necessitated this limitation in the scope of analysis. For example, the losses incurred by operators of passenger rail and bus services who lost customers due to post-deregulation modal transfer were precluded. Also not estimated were welfare changes to rail and bus passengers who may have experienced inconvenience due to discontinuation of under-patronised services. Subject to data availability, these areas could be investigated in future studies.

THE WELFARE ANALYSIS FRAMEWORK

Four main economic concepts were employed in estimating the welfare changes brought about by aviation reform — 'full price', 'consumer surplus', 'economic rent', and 'schedule delay'. These concepts are discussed briefly in the following section.

Full price

This study assumed demand for airline services involves two costs to the traveller: first, the cost of the ticket and second, the cost of the time spent in travel or waiting to travel and of any associated inconvenience and discomfort. Travel time has a cost because it could have been put to a more productive or pleasurable use. The full price that a traveller pays is the sum of these two costs. It was assumed that the amount that individual travellers would be willing to pay for a reduction in travel time could be measured and that this amount was also the amount by which they would be better off if aviation reform resulted in faster or more convenient travel.

The demand for airline services was assumed to be responsive to the full price that a traveller has to pay. The kind of demand relationship assumed is depicted in figure 9.1.

As shown in the figure, the air fare which was paid before reform is represented by P and the corresponding level of demand for airline travel by Q. The line DD represents the demand relationship between the air fare and the number of airline passengers.

A service quality improvement, such as a reduction in travel time, can be represented by a shift in the demand curve from DD to D*D* and, through the relationship between full price and demand, a corresponding increase in either demand to Q* or price to P* (reflecting an increased willingness to pay at any given level of demand).

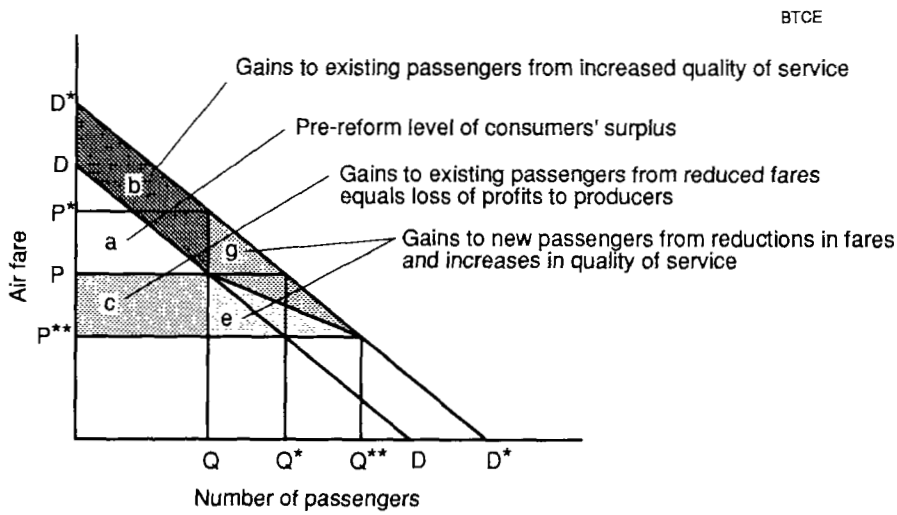


Figure 9.1 Welfare analysis framework for aviation reforms

A reduction in air fares is depicted by a reduction from P (the base level of air fares) to P**. Assuming that demand at price P has increased from Q to Q* due to the shift in the demand curve from DD to D*D*, a reduction in air fares from P to P** will further increase demand from Q* to Q**.

Consumer surplus

An individual's consumer surplus is defined (roughly) as the difference between the full price which a traveller is willing to pay for airline travel and the full price actually paid. Aggregate consumer surplus is estimated as the area under the demand curve less the sum of the prices paid. This is a partial measure because it takes no account of the likely flow-on effects in the rest of the economy of changes in spending on airline travel. For instance, increased travel means increased congestion and environmental impacts which would need to be subtracted to arrive at a complete measure. On the other hand, a diversion of traffic from other modes such as the passenger motor vehicle travel could reduce congestion on the roads and traffic fatalities. It is also a rough approximation because it takes no account of the effect of changes in spending power occasioned by changes in airline prices.

The base (pre-reform) level of consumer surplus is depicted in figure 9.1 as area a, representing the sum of the differences between willingness to pay and what it would have cost to travel if there had been no reform. In the event of reform occurring, these passengers who would have travelled in any event, derive additional surplus from improvements in the quality of service, depicted by area b, and from reductions in air fares, depicted by area c.

Area e represents net consumer surplus benefits to airline travellers who have been induced to fly on account of reductions in air fares.

Area g represents net consumer surplus benefits to airline travellers who have been induced to fly on account of improvements in service quality.

Economic rents

Economic rent is loosely defined here as payment in excess of that necessary to elicit an (airline) service. Before aviation reform, airlines charged higher prices for airline travel than was justified by efficient long-run average costs of service provision. Some of the revenues from these higher prices went into higher airline profits than were necessary to provide an adequate return on funds invested and some went into using more resources than were necessary at factor prices which were above their opportunity costs, particularly employees and their wages. In the more competitive market since aviation reform, airlines have shed staff, rationalised other inputs such as maintenance, reduced their fares and increased output and service quality.

The reduction in air fares payable by the set of passengers who would have travelled even without reform is a loss to the airlines which exactly matches the gain to the passengers. So the loss to airlines offsets the gains to consumers in area c and represents a transfer between these two groups. Part of area c however, is recovered by the airlines through increased productivity stemming from more efficient utilisation of resources under the new competitive pressures from aviation reform. This part is a net gain to the economy. The other part is a loss of airline profits and factor rents (for example, lower wages to employees and tougher working conditions).

Because demand also expands (from Q to Q**), airlines also incur costs in increasing output to match demand. It is assumed that this increased output is achieved at constant long-run marginal and average costs which are equal to the air fares P**. This assumption is made as, with the exception of Compass which had costs lower than that of the incumbent airlines (Trade Practices Commission 1992), the increased output was largely achieved through the more efficient use of existing fleets, personnel and infrastructure. Kirby (1981) found that the minimum efficient scale of an airline is about five aircraft and beyond this point airline costs as a function of numbers of aircraft is quite flat.

QUALITY OF SERVICE

Quality of service in aviation encompasses many aspects such as network coverage, safety and security, service continuity, on-board service, etc. Change in the quality of service in the reformed aviation market is covered in detail in chapter 7, in which it is illustrated that the main service quality changes have been in the time-dependent aspects of service quality, namely, on-time performance, schedule delay, and travel time. Analysis in chapter 7, using CAA data, concludes that there has been no significant change in the on-time performance of domestic airline operations since deregulation. The analysis in this chapter of welfare changes from changes in service quality therefore concentrates on changes in schedule delay and changes in travel time.

Schedule delay

An important measure of service quality in the aviation industry is the length of time between when a traveller would ideally wish to depart from the airport and the departure time of the closest scheduled flight on which a seat can be obtained.

By way of example consider a Sydney business traveller wishing to attend a morning meeting in Melbourne at 11.30. If the total travel time between offices is estimated to be 2 hours — made up of 30 minutes to Sydney airport, 60 minutes in the air, and 30 minutes to the Melbourne office — then an ideal

flight departure time will be close to 10.00. However, if the only available flights that morning leave at 8.00, 9.30, and 11.00, the traveller will have to take the 9.30 flight incurring a 30-minute inconvenience. If the 9.30 flight is full the traveller will have to take the 8.00 flight incurring a two-hour inconvenience. If the individual inconveniences experienced by all travellers on a particular route are summed, and the sum divided by the number of travellers, we obtain an average measure of expected delay, or inconvenience, for the route. This average measure of expected delay, arising from the structure of airline schedules and available capacity is termed 'schedule delay' by researchers Douglas and Miller (1974).

Using a combination of simulation modelling and Markov analysis, Douglas and Miller developed a model to estimate schedule delay within any specified market (city pair combination). The model calculates schedule delay as the sum of delay incurred as a result of the number of flights available (frequency delay) plus delay incurred by stochastic (random) demand variation resulting in full flights (stochastic delay).

Frequency delay is 'the expected differential, in minutes per passenger, between the most desired departure time and that of the closest scheduled departure'. In the example of the Sydney business traveller this would be 30 minutes, being the difference between the preferred departure time of 10.00 and the closest scheduled flight at 9.30.

Stochastic delay is the expected length of delay a potential traveller faces because of the chance that the most preferred flight will be fully booked and he/she will have to select another and possibly even a third or a fourth and so on. In the above example the business traveller finding the 9.30 flight fully booked has to take the 8.00 flight, thus incurring an additional 90-minute (stochastic) delay.

In the following analysis of welfare change this model of Douglas and Miller was used to derive estimates of any changes in schedule delay (and associated welfare) on domestic aviation routes in the pre and post-reform market. The model is discussed in more detail in appendix IV.

Valuation of travel time savings

Travel time savings have an intrinsic value made up of both an opportunity cost and a marginal disutility cost (Hensher 1989, p. 224). The opportunity cost of travel results from the reduction or loss of employee productivity during travel whereas the disutility cost results from the traveller's preference for spending the time taken to travel in other pursuits.

This study used values of business and leisure travel time derived by Hensher (1989). Hensher derives a set of average travel time values, covering travel for both work and non-work purposes, and a range of values of travel time

TABLE 9.1 VALUES OF AIR TRAVEL TIME SAVINGS BY PURPOSE OF TRAVEL

(December quarter 1991 $ per hour)

Category	*Business*	*Leisure*
Schedule delay time	24	12
Travel time	24	8

Source Hensher (1989), p. 228.

savings for both business and leisure travellers. The mid-points of Hensher's travel time value ranges are used in this study for the monetary value of schedule delay and travel time savings. These values are presented in table 9.1.

A problem arises when costing variations in schedule delay because it is a change in convenience that is being quantified rather than a change in actual transit time. Douglas and Miller (1974) examined this problem and came to the conclusion that although data to obtain definitive measures of the value of schedule delay were unavailable, values of travel time could be used as an upper limit to the value of schedule delay.

Ratios of business to leisure traveller are required for each domestic aviation route in order to undertake a route by route welfare analysis. Ratios determined in BTCE and NZ Ministry of Transport (1991) are used.

COUNTERFACTUAL SIMULATION OF DEMAND FOR AVIATION PASSENGER SERVICES

One part of the analysis concerned the evaluation of increases in consumer surplus arising from the reductions in air fares which were brought about by the reforms to aviation policy. In order to do this analysis it was necessary to simulate the level of demand which would have prevailed but for the reforms.

A model developed by BTCE (1991a) was used to simulate this level of demand, which was then used as a benchmark for estimating how much demand had increased on account of the reforms. It was assumed that if there had been no deregulation then prices would have continued the same in real terms, that is, that nominal average air fares would have increased in line with general increases in prices as indicated by the consumer price index (CPI). This assumption accorded closely with experience under the two airlines policy (see BTCE 1991b, p. 16 and 1991c, p. 40).

Because the demand simulation was subject to error which may have some systematic bias, the demand growth due to reform was estimated as the

difference between two simulations, one the counterfactual simulation of what might have happened but for the reforms, and the other the simulation of what actually did occur.

A summary description of the model used to simulate demand for aviation passenger services is given in appendix V. This illustrates how well the model tracked over the estimation period, how well it has been tracking in recent times, and explores the possible reasons why the current model has failed to track actual demand. Also depicted is a simulation of what would have happened to demand had there been no aviation reform.

WELFARE CHANGES FROM REFORMS — ESTIMATION PERIOD AND SCOPE OF STUDY

The scope of the study was limited to estimating welfare gains from reforms to the domestic aviation market. Accordingly, interstate domestic deregulation was used as the point for comparison of pre- and post-reform domestic markets. Deregulation officially took effect on 31 October 1990. However, as the welfare model required quarterly aggregated data this study considered March 1991 as the first post-reform quarter. In doing so it was recognised that some welfare effects in the December quarter 1990 would be missed. However, it was felt that any estimation errors of the magnitude of welfare gains were best left on the low side.

There have been a number of other reforms to Australian aviation in recent times, such as the formation of the FAC and the CAA, and a reduction of the boundary between domestic and international aviation (see chapter 2). Welfare gains from the formation of the CAA and the FAC are mentioned later in this chapter in the context of gains to airline operators.

It has already been suggested in a study jointly commissioned by the Australian and New Zealand Governments that net benefits to Australia will flow from a single Australasian aviation market (BTCE & New Zealand Ministry of Transport 1991). Estimation of the net benefits to Australia resulting from the implementation of these reforms will form an interesting area for future studies when data, in due course, become available.

WELFARE CHANGE RESULTING FROM CHANGES IN SCHEDULE DELAY

The net welfare change to consumers resulting from changes in schedule delay on specific routes following domestic aviation reforms were estimated through the following summation:

$$\sum_i \sum_j \sum_k \sum_l \Delta \text{Schedule delay}_{ijk} * \text{Existing passengers}_{ijkl} * \text{Value of time}_l$$

$$+ 1/2 \sum_i \sum_j \sum_k \sum_l \Delta \text{Schedule delay}_{ijk} * \text{New passengers}_{ijkl} * \text{Value of time}_l$$

where: i is the post-deregulation quarter in which welfare change is achieved; j is the domestic city pair; k is direction of travel (city 1 to city 2, or city 2 to city 1); and l is purpose of travel (business or leisure).

The 'existing passengers' section of the equation models part of area b in figure 9.1. The 'new passengers' section models part of area g.

Change in schedule delay

To quantify a change in average schedule delay per person for a particular city pair, the schedule delay experienced in the post-reform quarter was subtracted from the schedule delay for the like quarter prior to reform. Thus June, September and December post-deregulation quarters were compared with 1990 June, September and December quarters respectively. March 1990 was not used as the pre-reform benchmark as during this period the industry was still recovering from the 1989 pilots' dispute and traffic levels were significantly lower than long-term average figures. Instead, March post-deregulation quarters were compared with March 1989.

Accounting for yield management systems

The schedule delay associated with a particular route is composed of both stochastic delay and frequency delay. However, operators employ sophisticated yield management systems to attain optimal ratios of full and discount fares per flight. It therefore seemed reasonable to assume that full fare travellers would be subject to less stochastic delay than discount fare passengers as blocks of full fare seats were likely to be held aside until the last minute before departure.

To account for this, two estimates of the welfare changes resulting from changes to schedule delay were calculated. On the one hand it was assumed that all passengers on a particular route faced the same schedule delay, and therefore the same stochastic delay. On the other hand it was assumed that all business passengers — a proxy for full fare paying passengers — face no stochastic delay. Clearly, both these approaches are simplifications of the real situation. Not all business passengers pay full fare, and not all flights will have blocks of full fare seats reserved right up until departure time. Therefore, the real answer probably lies somewhere between these two estimates.

Passengers benefiting from the change in schedule delay

In order to calculate the value of schedule delay changes, it was necessary to determine the relative numbers of passengers in the post-reform quarters that would have travelled anyway, irrespective of reform, and those that were induced to travel as a result of fare reductions and quality of service changes.

The passenger demand forecasting model indicated that there was virtually no growth in demand over the post-reform period attributable to factors other than the price cuts and service quality improvements due to deregulation (see appendix V). Therefore, a counterfactual zero growth assumption was made which attributed all growth in passenger numbers in post-reform quarters to reform-induced changes.

On routes which had experienced post-reform growth in passenger traffic, the number of pre-reform passengers was used as a proxy for post-reform traffic that would have occurred irrespective of the reform-induced changes. In the model above these are termed 'existing passengers'. The balance of post-reform traffic was deemed to have been generated by the reform-induced changes. In the model these are termed 'new passengers'. On routes which had experienced post-reform declines in passenger traffic it was deemed that reform stimulated no additional traffic, and accordingly, that all post-reform traffic would have occurred irrespective of reform-induced changes. On these routes all post-reform traffic are therefore 'existing passengers'.

The analysis involved a number of steps where data were averaged between time of day, day of week, and purpose of travel. Accordingly, the estimate obtained for the schedule delay time saved was an average per passenger and was thus treated as an average saving rather than a marginal saving.

Results

Table 9.2 presents a post-reform quarterly summary of the welfare changes resulting from changes in schedule delay.

Interpretation of results

While table 9.2 provides a general indication of what has happened in the post-reform market, it is important to note that these quarterly results are an aggregate for all domestic routes. Within these totals are hidden increases and decreases in schedule delay on individual routes. For example, in the September and December quarters of 1991 there was a substantial increase in the number of flights offered on many of the more popular domestic routes. However, at the same time on many of these routes the rate of increase in demand exceeded the rate of increase in the supply of seats, thus increasing average load factors. So, despite the advantage of a wider choice of

TABLE 9.2 WELFARE GAINS (OR LOSSES) RESULTING FROM CHANGES TO SCHEDULE DELAY

(December quarter 1991 $ million)

Period	*All passengers subject to stochastic delay variation*	*Business passengers subject to stochastic delay variation*
1991Q1	26	11
1991Q2	11	6
1991Q3	(12)	(1)
1991Q4	(13)	(1)
1992Q1	(5)	3
1992Q2	6	6
1992Q3	(2)	3

Note Numbers in brackets are negative.

Source BTCE estimates.

scheduled services (leading to a decrease in average frequency delay), the probability of obtaining a seat on the preferred flight had diminished (causing an increase in average stochastic delay). Where the increase in stochastic delay outweighed the decrease in frequency delay, an increase in the average schedule delay (decrease in economic welfare) resulted.

However, the use by airline operators of sophisticated yield management systems will minimise stochastic delay for premium fare passengers, thus mitigating the impact of stochastic delay increases on business travellers.

The Brisbane–Melbourne route is a good example of how schedule delay can vary with changes in flight frequency and load factor. In the December quarter 1990, 842 flights were available travelling from Brisbane to Melbourne at an average load factor of 79 per cent. The average schedule delay on the route was 79 minutes, made up of 34 minutes of frequency delay and 45 minutes of stochastic delay. In the December quarter 1991, 1050 flights were offered at an average load factor of 84 per cent. The average schedule delay was now 89 minutes, made up of 30 minutes of frequency delay and 59 minutes of stochastic delay. So despite the increase in flights on offer in the post-deregulation December quarter, increased load factors resulted in an increase in schedule delay and a resultant loss of welfare to travellers on this route.

A complete breakdown by post-reform quarter for Brisbane–Melbourne traffic is presented in table 9.3. The table gives an indication of the degree to which the components of schedule delay vary due to changes in flight frequency and average load factors.

TABLE 9.3 SCHEDULE DELAY CHANGES ON THE BRISBANE–MELBOURNE ROUTE

Period	Flights (no.)	Load factor (per cent)	Frequency delay (minutes)	Stochastic delay (minutes)	Schedule delay (minutes)
1989Q1	631	78	38	60	98
1990Q2	676	72	37	29	66
1990Q3	808	79	34	50	84
1990Q4	843	79	34	45	79
1991Q1	766	77	35	41	76
1991Q2	884	73	33	27	60
1991Q3	1010	86	31	83	114
1991Q4	1050	84	30	59	89
1992Q1	1001	85	31	73	104
1992Q2	1052	78	30	35	65
1992Q3	1135	79	29	37	66

Sources DTC, BTCE estimates.

Limitations of the analysis

When interpreting the results in table 9.2 it is important to be aware of certain limitations with the analysis. The main problem concerns those domestic routes on which regional carriers offer parallel services. When this study was undertaken, comprehensive data for regional operations were unavailable. Therefore, when evaluating schedule delay gains associated with all air travel options the actual available number of flights and thus the schedule delays experienced by travellers may be slightly mis-specified.

WELFARE CHANGE RESULTING FROM CHANGES IN DIRECT FLIGHT AVAILABILITY

The net welfare change to consumers resulting from reductions or increases in the time taken to travel between domestic ports of origin and destination (OD) was estimated through the following summation:

$$\sum_i \sum_j \sum_l \Delta \text{ Travel time}_{ijl} * \text{Passengers}_{ijl} * \text{Value of time}_l$$

where: i is the post-reform quarter in which welfare change is achieved; j is the top 30 domestic OD city pairs; and l is purpose of travel (business/leisure).

This equation models part of area b in figure 9.1.

Quantifying a change in travel time

When a traveller is forced, either through lack of available services or lack of seats on a desired flight, to take an indirect service between his or her ports of

origin and destination the inconvenience experienced can be measured as the difference between the direct and indirect trip duration.

The net changes in this measure of service quality were estimated by multiplying the number of passengers that gained (or lost) access to direct services as a result of post-reform schedule changes by an estimate of the time difference between a direct and an indirect service. The methodology is explained in more detail below.

Data constraints restricted this analysis to the top 30 OD routes for each post-reform quarter. This simplification may result in some bias. While the majority of OD passengers (those with a ticketed port of origin and destination corresponding to the route) are included in this analysis of the top 30 routes there may be some major changes in direct flight availability that were missed out. Based on the March quarter 1991, 85 per cent of all OD passengers were included in the top 30 routes.

Passengers affected by the change in travel time

The number of passengers subjected to a change in flight duration (direct versus indirect service) were estimated by comparing the availability of direct flights between ports of origin and destination before and after aviation reforms. For any one route the range of service possibilities facing passengers can be expressed in matrix form as illustrated below.

		Post-reform	
		No Direct Service	Direct Service
Pre-reform	No Direct Service	A	B
	Direct Service	C	D

In category A, OD passengers were unable to obtain a direct service in either the pre or post-reform period. Therefore, there were no net gains or losses to these passengers.

In category B, some or all of the post-reform OD passengers were able to obtain a direct service.

In category C, some or all of the post-reform passengers lost access to a direct service that they would have had in the pre-reform period.

Estimating the number of passengers affected by changes in access to direct services on category D routes was more complicated. For the top 30 city pairs two items of information were available: (1) the number of passengers that were actually carried on direct services between the two ports, termed traffic-on-board by stage (TOBS) passengers; and (2) the number of OD passengers. For the purpose of this analysis the assumption was made that if TOBS passengers was greater than OD passengers for any route, then all OD

passengers on this route obtained a direct flight. The possible range of TOBS to OD passenger ratios for these routes is illustrated by the following matrix:

	Base OD < Post-reform TOBS	Base OD > Post-reform TOBS
Base OD < Pre-reform TOBS	D1	D2
Base OD > Pre-reform TOBS	D3	D4

The method used to establish the number of OD passengers that were able to gain access to a direct service is explained in the following paragraphs.

Firstly, a base OD passenger number was established, representing the number of passengers that would have travelled in the post-reform period irrespective of any reform-induced changes. This was the lesser of the pre- and post-reform OD numbers.

On category D1 routes all OD passengers theoretically obtained a direct flight both pre- and post-reform. Therefore, there were no net gains or losses to travellers on these routes.

On category D2 routes some of the 'base' post-reform OD passengers lost access to a direct service and were forced onto an indirect service. The number of OD passengers who lost the direct service was counted as the number of 'base' OD passengers minus the number of post-reform TOBS passengers (post-reform available capacity).

On category D3 routes all the 'base' OD passengers who were unable to obtain a direct service in the pre-reform period were able to do so in the post-reform period. The number of OD passengers who then obtained a direct service and realised the associated time saving was counted as the number of 'base' OD passengers minus the number of pre-reform TOBS passengers (pre-reform capacity gap).

On category D4 routes there was a demand–capacity gap both pre- and post-reform. For those routes where available capacity increased post-reform, the number of OD passengers that gained a direct service was the difference between the pre- and post-reform TOBS. For those routes where available capacity decreased post-reform the number of OD passengers that lost a direct service was the difference between the pre- and post-reform TOBS.

Results

Table 9.4 presents a post-reform quarterly summary of the welfare changes resulting from changes in access to direct services.

TABLE 9.4 CONSUMER GAINS FROM CHANGES IN ACCESS TO DIRECT SERVICES

(December quarter 1991 $ million)

Period	*Welfare gain*
1991Q1	1.3
1991Q2	1.5
1991Q3	1.3
1991Q4	1.6
1992Q1	1.8
1992Q2	1.8
1992Q3	1.3

Source BTCE estimates.

Interpretation of results

These results indicate that net changes to consumer surplus as a result of the changes in the number of direct services available to travellers were fairly small. The reason the changes are small was largely that the bulk of the OD demand in these periods was adequately satisfied by direct services. For example, during the pre-deregulation (1990) March quarter and both post-deregulation March quarters (1991 and 1992) direct services were offered on all of the top 20 OD city pairs. In all three quarters, on 14 of the top 20 routes, the number of passengers utilising direct services — our proxy for available capacity — exceeded the OD demand; that is, demand was fully satisfied. The top 20 routes account for around 80 per cent of all OD demand. Therefore the number of passengers achieving (or losing) access to a direct service and incurring the time differential was relatively small.

Limitations of the analysis

OD data were unavailable prior to 1 July 1990, preventing the use of March and June quarters 1990 as base data sets. To resolve this problem, the September quarter 1990 was chosen as a surrogate base to allow for comparison with March and June post-reform quarters. Choosing this base possibly introduced some distortion into the results, due to the seasonal nature of airline patronage. However, these errors are likely to have been relatively insignificant.

WELFARE CHANGE RESULTING FROM REDUCTIONS IN AVERAGE AIR FARES

We estimated the net welfare gains to consumers resulting from the reductions in air fares following domestic aviation reform through the following summation:

$$\sum_i \Delta \text{ Air fare}_i * \text{Existing passengers}_i + 1/2 \sum_i \Delta \text{ Air fare}_i * \text{New Passengers}_i$$

where *i* is the post-reform quarter in which welfare change is achieved.

The 'existing passengers' section of the equation models all of area c in figure 9.1. The 'new passengers' section models all of area e.

Changes in air fares

The magnitude of the gain in aggregate consumer surplus due to domestic fare discounting is the sum of individual gains and losses realised by all travellers on the post-reform network.

In an ideal model this estimate would be obtained by summing individual passenger's gains (or losses) by class of fare paid by route. However, data were not available in this degree of detail. The approach adopted in this analysis was to obtain an estimate of the average fare paid over the whole network for post-reform travel and subtract this from an estimate of what the average fare would have been if the aviation reforms had not occurred. This difference between forecast and actual average fares was used in the model as the average value of the air fare change.

Estimates provided by the Prices Surveillance Authority were used to derive quarterly average fares that were actually paid for post-reform travel. These were the best estimates currently available and, being based on fares sold on the top 21 interstate routes, which carry around 80 to 85 per cent of all traffic, should closely emulate network-wide average fares (for further detail on developments in domestic air fares see chapter 6).

The quarterly non-reform counterfactual air fares were estimated by inflating a base value of the average fare paid for travel in the September quarter 1990 by the quarterly rate of change in the consumer price index. The consumer price index was used, as empirical evidence showed that growth in the average full economy fare over the last decade has been very closely linked to growth in the consumer price index.

Table 9.5 summarises the estimation of reductions in average actual fares due to reforms.

Passengers benefiting from the reduction in air fares

The following method was used to estimate the number of 'existing' and 'new' passengers who realised gains from the post-reform reductions in air fares.

Firstly, the passenger demand forecasting model was run with the actual average fare paid for post-reform travel. Actual (observed) data were also

TABLE 9.5 REDUCTIONS IN AVERAGE FARE PAID FOR POST-REFORM TRAVEL

($)

Period	Counterfactual non-reform average fare	Actual average fare	Difference in average fare
1991Q1	207	182	25
1991Q2	207	183	24
1991Q3	209	143	65
1991Q4	211	138	72
1992Q1	211	157	54
1992Q2	210	172	38
1992Q3	210	166	45

Sources PSA, BTCE estimates.

used for all other parameters. This yielded quarterly post-reform estimates of actual travel demand.

Next, the demand model was run with estimates of what would have been the average fare paid if reforms had not occurred (counterfactual non-reform average fare). All other variables were as above. This yielded quarterly post-reform estimates of demand for travel that would have occurred without price cuts.

The differences between these two sets of results yielded quarterly estimates of the number of passengers stimulated to travel as a result of price cuts. These are the 'new passengers'.

Finally, these 'new passengers' were subtracted from the actual (observed) demand in the post-reform period to arrive at estimates of the number of passengers who would have travelled irrespective of price cuts. These are the 'existing passengers'. Estimates for 'new' and 'existing' passengers are presented in table 9.6.

This method of estimating 'existing' and 'new' demand was significantly different from the method used to estimate demand for the schedule delay and the direct service parts of the model. However, the different methods yielded results which were acceptably similar. For example, the passenger demand forecasting method yielded the values of 0.2 million new passengers and 3.4 million existing passengers for the March 1991 quarter, whereas the method used in the schedule delay section yielded values of 0.5 million new passengers and 3.1 million existing passengers.

TABLE 9.6 POST-REFORM NUMBERS OF EXISTING AND NEW PASSENGERS

(millions)

Period	*Existing passengers*	*New passengers*	*Total passengers*
1991Q1	3.4	0.21	3.6
1991Q2	3.6	0.19	3.7
1991Q3	4.2	0.68	4.9
1991Q4	4.3	0.74	5.1
1992Q1	3.9	0.50	4.4
1992Q2	3.9	0.33	4.2
1992Q3	4.1	0.43	4.5

Note Estimates differ slightly from Smith and Street (1992) due to updated data.

Sources DTC, BTCE estimates.

Results

Gains to existing passengers from the reduced fares come at an equivalent loss to producers, and are a direct transfer of welfare. As such, these figures, while certainly representing substantial gains in consumer surplus, do not contribute to any net welfare gain. However, the gains to passengers who chose to fly in response to the price cuts are net economic welfare gains within the aviation market. Bearing in mind that this is a partial equilibrium analysis, there may have been consumer surplus changes to the existing passengers of rail and bus modes, resulting from service frequency reductions and/or load factor changes and fare variations caused by the drain of passengers to air transport. Consumer surplus changes in these other modes will have affected the net economic gains to the community. However, we did not have the data to quantify any such changes.

TABLE 9.7 GAINS IN CONSUMER SURPLUS FROM LOWER AIR FARES

($ million)

Period	*Gains to existing passengers*	*Gains to new passengers*	*Total gains*
1991Q1	86	3	89
1991Q2	85	2	87
1991Q3	274	22	296
1991Q4	314	27	341
1992Q1	209	14	223
1992Q2	145	6	151
1992Q3	182	10	192

Source BTCE estimates.

Table 9.7 presents a quarterly post-reform summary of the consumer surplus gains to both 'new' and 'existing' passengers. It is interesting to observe that the magnitude of quarterly consumer surplus gains declined in the first half of 1992 as capacity and prices adjusted following the exit of Compass Mk1. However, despite rises in average fares through to the June quarter of 1992 the average fare paid for travel during this quarter was still around 18 per cent lower than expected average fares under a continuation of regulation.

WELFARE CHANGE TO PRODUCERS RESULTING FROM INCREASED COMPETITION

This part of the model discusses estimates of the net losses and gains incurred by domestic air transport operators as a result of the changes to profit levels and cost structures brought about by a post-reform increase in competition. This includes estimates of the economic rents lost to producers as well as preliminary estimates, based on available data, of the magnitude of cost savings achieved by operators.

Loss of economic rents

Prior to reform of the domestic aviation market, domestic airline operators by virtue of the existing market structure were able to extract economic rents from the flying public. With the increase in competition post-reform average air fares were forced down towards or even below the average cost of service provision. This difference between actual average fare paid for post-reform travel and the average fare that would have been paid if there had been no reform represents a loss of profits to the airlines, being this difference in fare times the number of passengers that would have flown irrespective of reforms. Producer losses are quantified only within the aviation market. The loss of economic rents to aviation market producers is presented in table 9.8.

Cost of Compass Mk1 collapse

No evaluation of net producer losses would be complete without an estimation of the welfare loss resulting from the collapse of Compass Airlines in December 1991. Compass losses were very large. However, the majority of these losses were transfers between various classes of debtors and creditors.

The operating loss incurred by Compass as a result of selling seats below the cost of provision should, however, be included in the estimation of net welfare changes. The transfer component to existing passengers resulting from reduced fares has already been netted out and it remains to take out the transfer component to new passengers. Information from the Trade Practices Commission report on Compass' collapse and BTCE estimates of Compass costs was used to arrive at a figure of 3.5 cents loss incurred by Compass per

TABLE 9.8 ESTIMATED LOSSES TO OPERATORS
($ million)

Period	*Transfer to existing passengers (due to average fare reductions)*	*Transfer to new passengers (Compass Mk1 pricing below cost)*
1991Q1	(86)	*0*
1991Q2	(85)	*0*
1991Q3	(274)	(3.5)
1991Q4	(314)	(3.3)
1992Q1	(209)	
1992Q2	(145)	
1992Q3	(182)	

Note Numbers in brackets are negative.

Source BTCE estimates.

passenger-kilometre over the last two quarters of 1991 (before then Compass was breaking about even). These transfers are presented in table 9.8.

Estimates made in chapter 8 indicate that during the 1991–92 financial year, which included the period of deep discounts and intense competition which saw Compass Mk1 pricing below cost, Ansett and Australian made small positive economic rates of return on assets. It is therefore assumed that on the basis of average yields obtained, Australian and Ansett were not pricing below cost.

Gains resulting from operational efficiencies

Increased pressure to become more competitive and cut costs to compensate for reduced revenues has forced the incumbent airlines to introduce a range of efficiencies into their operations. Some of the more significant changes to date have occurred in the areas of staff productivity gains — pilot reductions and general staff rationalisations — and in the rationalisation of maintenance facilities.

1989 pilots' dispute

For the purpose of this study financial gains to domestic operators flowing from resolution of the 1989 pilots' dispute were attributed to aviation reforms. These gains were determined by estimating the difference in the number of pilots that were employed pre- and post-dispute to undertake the same magnitude of transport task, and multiplying this difference by the average quarterly cost of employing a pilot to obtain an upper limit to the saving.

TABLE 9.9 ESTIMATED WELFARE GAINS FROM REDUCTIONS IN PRODUCER LABOUR COSTS

($ million)

Period	*Reductions to pilot work force*	*Reductions to general work force*
1991Q1	5.4	0
1991Q2	5.4	1.2
1991Q3	5.4	2.4
1991Q4	5.4	3.6
1992Q1	5.4	4.8
1992Q2	5.4	5.8
1992Q3	5.4	6.7

Source BTCE estimates.

To convert this cost saving to a welfare gain it was reduced by the welfare loss to pilots as a result of changed work conditions. This conversion was made using the assumption in BTCE and NZ Ministry of Transport (1991) that average employee losses from work practice efficiencies are approximately two-thirds of the gain to producers. Readers who disagree with this assumption can make the necessary adjustments in table 9.9. No further adjustments were made to this figure to account for the personal financial losses incurred by pilots who lost their jobs and were forced to obtain lower paid employment. It was considered that this simply constituted a devaluation of the labour asset, and while being a loss to the individual was not a loss to society. This assumption was also applied when evaluating the gains from general labour productivity improvements.

Haddad (1991) cites estimated losses to the airlines during the period of the pilots' dispute of about $150 million for Australian and $106 million for Ansett. Resulting from the dispute Australian reputedly cut pilot numbers from 547 to about 280, realising cost cuts of $21 million per year. Eastwest reputedly cut pilot numbers from 142 to 72 and Ansett from 974 to about 490. Based on an extrapolation of Australian's savings, cost savings for Ansett and Eastwest combined could be expected to be in the order of $44 million per year. In summary then it can be broadly concluded that cost savings from pilot labour restructuring saves the airline industry about $65 million per year. This saving translates to a welfare gain when two-thirds is removed, being loss of welfare to pilots who have to work harder for the same level of pre-dispute remuneration. The resultant net welfare gains are shown in table 9.9.

General work force productivity improvements

In the lead-up and subsequent to deregulation the incumbent operators pursued significant work force rationalisation programs, resulting in reductions

to total staff numbers, while at the same time expanding the scale of their operations to meet the post-deregulation growth in demand. BTCE estimates based on a range of data sources including media and airline annual reports give total staff reductions across incumbent operators of 1163 personnel between calendar years 1990 and 1991, and 898 personnel between 1991 and 1992 (see chapter 8).

The actual timing of each termination and the magnitude of individual redundancy payments was not known. Therefore, for the purpose of deriving quarterly estimates of welfare gain it was assumed that the terminations were spread equally between quarters, that is, 291 terminations during the March quarter 1991, and so on. It was also assumed that, because in many cases termination will involve the employer making a redundancy payment, any gains flowing to operators will begin three months after an employee has left.

Assuming an annual total employee cost of $50 000 an upper limit to the saving was obtained of $12 500 per quarter per employee. This figure converts to a welfare gain when reduced by two-thirds to account for the loss of welfare to remaining employees who are required to work harder. Table 9.9 summarises the savings to producers resulting from these lower staff costs.

Other areas of cost savings

Quantitative information on the savings resulting from rationalisation of maintenance facilities was unavailable. However, these probably represent significant savings in overhead costs to the incumbent operators. A few examples of such rationalisations include the closure of the Ansett WA heavy engineering workshops at Perth airport (circa April 1991), the absorption by Ansett of the Eastwest engineering facilities at Sydney airport (circa July 1991), and the closure of the Eastwest maintenance facility in Tamworth (circa August 1991).

Another area where operators have realised gains is in the reduction of charges levied by the CAA. Following the introduction of a number of efficiency measures, the CAA expects to reduce its operating expenses by around 17 per cent in real terms in the 1992–93 financial year. These gains are expected to be passed on to airline operators through a reduction in airway charges, resulting in gains to operators of around $96 million in 1992–93 (see chapter 8 for more detail). As the majority of these efficiency gains are to be achieved through staff reductions, only one-third of the saving can be claimed as a welfare gain. This will result in a gain of $32 million per year, or around $8 million per quarter commencing in the September quarter 1992, spread across all operators, regional, domestic and international. Thus, in addition to the net welfare gains to domestic operators shown in table 9.9 a further gain of somewhat less than around $8 million can be included for the September quarter 1992.

One further area where operators have faced changes to costs resulting from aviation reforms is in the levying of charges by the FAC relating to the use of aviation infrastructure. Charges are collected by the FAC on the basis of user-pays cost-recovery, and replace a more generalised regime of charging which for 25 years preceding establishment of the FAC in 1988 had failed to fully recover costs in any single year (FAC 1993). Any higher costs faced by operators represent a direct transfer of the previous shortfall which had been made up by taxpayer contributions. The change in charging regime also has a number of efficiency implications. Firstly, a user-pays regime would have the effect of encouraging operators to examine more closely their use of any facilities or services which attract a cost, and cease using any they do not need. Secondly, operators would now be more vigilant in pressuring the FAC to improve its efficiency and thus reduce charges. However, it is questionable whether airlines have many options in the use of airport services, and this tends to grant the FAC natural monopoly status.

SUMMARY OF RESULTS

A summary of results is presented in table 9.10. This summary table includes the quarterly post-reform welfare gains and losses attributable to changes in schedule delay (results shown assume that business travellers incur no stochastic delay), changes in the availability of direct services, average air fare reductions, and changes in costs and revenues to producers. Quarterly results are presented, rather than half or full year aggregates, as changes are occurring in the aviation market on a frequency which are best illustrated by a quarterly exposition, a situation that is likely to continue for some time yet.

TABLE 9.10 SUMMARY TABLE OF QUARTERLY GAINS (AND LOSSES) IN ECONOMIC WELFARE

($ million)

Period	*Changes to schedule delay*	*More direct flights*	*Lower fares (existing pass.)*	*Lower fares (new pass.)*	*Operator gains (staff cuts & CAA charges)*	*Operator losses (lower fares)*	*Operator losses (Compass Mk1)*	*Total welfare change*
1991Q1	11	1.3	86	3	5.4	(86)	0	21
1991Q2	6	1.5	85	2	6.6	(85)	0	16
1991Q3	(1)	1.3	274	22	7.8	(274)	(3.5)	27
1991Q4	(1)	1.6	314	27	9.0	(314)	(3.3)	33
1992Q1	3	1.8	209	14	10.2	(209)		29
1992Q2	6	1.8	145	6	11.2	(145)		25
1992Q3	3	1.3	182	10	20.1	(182)		34

Note Numbers in brackets are negative.

Source BTCE estimates.

A sensitivity analysis of key parameters of the welfare change model can be found at appendix VI.

It would be desirable to adjust the figures shown in table 9.10 to account for welfare gains or losses to international visitors to Australia using domestic air services. Any changes in the consumer surplus of these passengers will change the net welfare gain to Australia. Having said this, there are insufficient data to quantify the magnitude of these gains and losses. However, it is expected that they would somewhat reduce the above net gains to Australia.

Data are not available on which domestic air routes these passengers fly; thus it is not possible to assign gains and losses from changes in schedule delay and access to direct flights. Regarding the gains to international visitors from lower average air fares, the magnitude of these gains depends on a number of factors. Firstly, it is only discount fares that have fallen in real terms over the period of this study; by and large full economy and premium fares have risen. Thus many of the short-stay business visitors undertaking domestic travel, who probably purchased full fares due to the same factors that encourage Australian business travellers to purchase full fares, are in fact worse off, resulting in a welfare gain to Australia. Secondly, of the leisure visitors, not all are in a position to take advantage of discount domestic fares. Factors such as timing of discounts, duration of the holiday, and whether the holiday itinerary was pre-arranged and pre-purchased will all reduce the number of visitors able to either spontaneously react to a discount fare or plan one into their holiday. This is not to say of course that some visitors did not take advantage of the cheaper fares. It is the consumer surplus gain of this group of visitors that should be subtracted from the welfare gain to Australia.

CONCLUSIONS ON WELFARE GAINS

There is sound evidence to indicate that there have been net economic welfare gains to the Australian community resulting from the domestic aviation reforms of the last few years. While these estimates of welfare changes show only broad orders of magnitude, they are nevertheless indicative of the gains made to date. It is interesting to note that, on an annual basis, estimates obtained in this analysis, although derived using a different methodology, accord quite closely with the benefits from deregulation forecast in BTCE and NZ Ministry of Transport (1991).

There is considerable scope for further analysis of welfare gains. Within the Australian domestic context, additional areas where further analysis could be undertaken include re-estimating the parameters of Douglas and Miller's schedule delay formula, deriving a sliding scale for the value of schedule delay time for both business and leisure passengers, and interrogating airline timetables to refine our estimates of the impact of changes to direct flight

availability. Further evaluation of the benefits which resulted from the formation of the CAA and the FAC could also be undertaken. Within the broader context, there is also scope for estimation of welfare gains resulting from recent reforms of the Australian international–domestic market boundary. As Qantas delves deeper into the domestic market and further integrates its operations with the old Australian Airlines, as the trans-Tasman boundaries fall, and as Ansett commences international operations, Australia should continue to experience net welfare benefits. Further analysis will reveal the nature and magnitude of these benefits.

CHAPTER 10 CONCLUSIONS

Reform of Australian Aviation in the last five years has been extensive: a new basis for negotiating bilateral agreements aimed at maximising the benefits to Australia; deregulation of interstate aviation in 1990; the move towards removing the barriers between domestic and international markets; establishment of the FAC and the CAA to undertake the provision of aviation infrastructure; the merger of Qantas and Australian; and the sale of the new merged entity. These reforms, as has been demonstrated in this report, have already produced, and are continuing to produce, tangible benefits to the Australian economy and consumers of aviation services.

OUTCOMES OF THE REFORMS

Structure

In these last five years the structure of the Australian aviation industry has changed considerably. While the changes in the industry structure which have taken place so far could not be said to be large in terms of the number of market participants or changes in route structure, they have been highly significant in engendering a change in attitude and conduct. The structural difference lies in freedom of entry and exit from the market and in the greater freedoms which now exist for established airlines to compete against each other. There is not complete freedom: certain intrastate airline markets are still regulated, foreign airlines, with the exception of Air New Zealand, are not permitted to provide domestic scheduled services in Australia and international airline freedoms are constrained by the bilateral process of negotiating market access; but the regulatory changes which have occurred have radical implications for industry conduct and performance such that the industry is far more competitive than it was in 1987.

Competition has been the key to stimulating the industry to provide better services at the lowest possible price. Domestically, the minimisation of barriers to entry and the actual entry of new competitors have been critical to the generation of vigorous competition. Internationally, a system is in place to encourage further competition and to ensure a consistent balance between the

interests of Australia's aviation and tourism industries. Moreover, the distinctions between international and domestic markets which prevailed even one year ago have already become blurred with consequent improvements expected for travellers, and particularly international tourists, in the availability of 'seamless' airline services.

Available evidence suggests that the scope for entry at a major level into the Australian domestic airline market is quite restricted. This is quite apart from the psychological effects on the availability of risk capital and credit facilities of two successive new entrant airlines running into problems, and the current effects of the most serious recession in sixty years, which has seriously reduced the potential to stimulate demand. The discount leisure or genuine economy travel market appears to have the most potential for new entrant competition, but demand factors and the possible economies of route density appear to be powerful forces favouring the long-term survival of large airlines. However, there may still be scope for a new entrant to enter the market as a smaller operator. In addition, there may still be scope for 'niche' carriers if they are able to sufficiently differentiate their product or get access to lower cost inputs.

Conduct

The key aspects of service quality have either improved or remained constant over the post-deregulation period examined. Flight frequency on the 50 busiest routes served by the domestic airlines increased; on-time performance improved; the level of non-stop service improved (both the number of non-stop routes and the frequency of non-stop flights provided by the domestic airlines); and available evidence supports the conclusion that the service quality aspects of safety, passenger accessibility to the RPT network, airport services and facilities, and on-board comfort and service have at least remained relatively constant.

Domestic air travel has on average become cheaper since deregulation, due to a greater availability and depth of discount fares, a development in which the presence of Compass Mk1 and Mk2, and the increased competition between Ansett and Australian have all been contributing factors. However, travel has not been cheaper for all, the main beneficiaries of lower prices being travellers able or prepared to fly on discount fares. While discount fares have become deeper and more available, the full economy, first and business class fares of the incumbent airlines have all risen in real terms. Balanced against these incumbents' price rises, of course, were the cheaper full economy fares of Compass Mk1 and 2 and the cheaper business class fares of Compass Mk2. However, these fares did not appear to be overly attractive to quality sensitive business travellers, the group at which they were aimed, as Compass was not able to not match Ansett and Australian in terms of quality

attributes such as network coverage, business lounge perks, and frequent flyer benefits.

Performance

Industry and airline performance has been mixed. Periods of strong output growth have been interspersed with flat spots and debilitating disputes. Periods of satisfactory financial performance were mixed with low rates of return. Domestic airline modal share, however, is currently at an all-time high and propensities to travel by air domestically and internationally have both shown significant gains.

There have been both winners and losers in the process of reform. The winners have been most airline passengers. In the domestic market there have been clear gains to consumers in almost all aspects of pricing and service quality. On the other hand, airlines have lost profits and their employees have less employment security. Given that there was no opportunity to volunteer for these changes it cannot be said that there has been an improvement in allocative efficiency in the strict sense of Pareto optimality. However, calculations of economic welfare show that the gains are clearly larger than the losses, to the extent of some $100 million per annum.

Future benefits from aviation reforms

In addition to the ongoing benefits from reforms it is highly probable that there is scope for further improvements in industry performance. Productivity gains take longer and may be harder to achieve than increases in competition and corresponding benefits to consumers. Some areas where there is scope for productivity improvements under current policy settings are the following:

- CAA productivity is likely to improve when the new airspace management and radar systems, AMATS and TAATS are fully implemented, with flow-on gains for airlines.
- New investment projects such as Sydney's Kingsford-Smith Airport third runway will indirectly improve airline productivity through reducing traffic delays.
- The use of flight engineers will eventually be discontinued in all aircraft as current Boeing 767's and Airbus A300's are replaced.
- Deregulation of intrastate aviation in New South Wales, Queensland and Western Australia might bring about a productivity improvement in regional airlines, although a preliminary scoping exercise undertaken by the BTCE suggests that the likely upper limit of welfare gains from this source would be no more than about $12 million per annum.

- Qantas/Australian productivity is likely to improve following the implementation of a report by Coopers & Lybrand on the scope for productivity improvement following the merger of the two airlines. The Coopers & Lybrand review recommended a reduction in staff numbers of 1835. A reduction of around 1000 staff is expected to have been achieved by mid 1993, and while more staff reductions are expected to occur in later periods it is likely that the figure of 1835 will be reduced somewhat before the staff rationalisation process is complete.
- International airline productivity may improve if further competition is engendered by Australia's multiple designation and other policies announced in the *One Nation* statement. For instance, the possible entry of Air New Zealand into the Australian domestic market could be a powerful force for competition.

All of this aviation reform takes a lot of digestion by the industry, and it is expected that the effects of the reforms undertaken so far will still be making themselves felt in the seven years to the turn of the century. Certainly, the aviation industry in the United States is still settling down after a much longer period of experience with market reform. Nevertheless, the overall impression with Australian aviation reform is one of progress made — there may still be a long haul before anyone is completely satisfied with the efficiency of our airline system or its contribution to Australia's competitiveness, but so far we can judge that we are on target and on the right track.

APPENDIX I FREQUENCY OF SERVICE PROVIDED BY DOMESTIC AIRLINES

Table I.1 presents data on flight frequencies, passenger numbers, route capacity and average load factors on selected routes[1] served by the domestic airlines in Australia during the September quarter in 1990, 1991 and 1992. It demonstrates the use of data provided by the airlines to the Department of Transport and Communications to produce time series of quality of service indicators for a particular set of routes.

The data were obtained from the Department's traffic-on-board tabulations for the domestic airlines. The passenger data represent passengers travelling non-stop between the designated centres regardless of origin and destination. Thus, passengers were counted more than once if their total journey involved intermediate stops (for example, Sydney–Melbourne–Perth).

Seat numbers on any individual route were derived by multiplying the passenger numbers by the average load factor. Passenger and seat numbers enable the analyst to more accurately interpret the trends in frequency of service over time. For example, an increase in frequency may have been due to the substitution of smaller aircraft on a particular route. There may then have been an offsetting decrease in the quality of service in regard to aspects such as on-board comfort and service.

Between the September quarters in 1990 and 1992 the number of trips on the selected routes increased by 30 per cent. There was a 27 per cent increase in seat numbers, with seats on the Melbourne–Sydney route exceeding 1 million in 1991 and 1992. Passenger numbers rose by 31 per cent in the September quarter of 1992 when compared to the September quarter 1990.

Between the September quarters 1991 and 1992 there was an increase of 8 per cent in the number of trips on the selected routes. However, seat

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1. The routes included were those which were in the top 40 routes on the basis of passenger numbers during January 1990, and which continued to be served in each quarter.

availability increased by only 2 per cent, reflecting the demise of the original Compass Airlines, with its large capacity aircraft. The number of passengers showed a decrease of 4 per cent over the period as passenger numbers returned to more 'normal' levels following the air travel boom resulting from the fare wars during the second half of 1991.

TABLE I.1 SERVICE FREQUENCY ON SELECTED ROUTES SERVED BY DOMESTIC AIRLINES, SEPTEMBER QUARTERS 1990, 1991 AND 1992

Route	*Trips*	*Passengers*	*Average load factor (per cent)*	*Seats*
September quarter 1990				
Adelaide–Alice Springs	374	51 463	78.7	65 364
Adelaide–Melbourne	2 165	218 701	73.3	298 229
Adelaide–Perth	685	66 198	76.3	86 722
Adelaide–Sydney	1 356	129 509	75.0	172 679
Alice Springs–Ayers Rock	464	17 028	61.3	27 763
Alice Springs–Cairns	336	20 042	58.1	34 476
Alice Springs–Darwin	404	51 547	74.3	69 377
Alice Springs–Sydney	365	31 071	72.4	42 896
Brisbane–Cairns	987	95 425	79.9	119 431
Brisbane–Darwin	282	26 576	78.2	33 985
Brisbane–Hamilton Island	287	18 633	64.4	28 933
Brisbane–Mackay	457	24 567	62.3	39 433
Brisbane–Melbourne	1 604	161 416	79.4	203 209
Brisbane–Rockhampton	730	48 916	61.4	79 625
Brisbane–Sydney	3 912	444 744	74.7	595 108
Brisbane–Townsville	1 096	99 612	77.2	128 975
Broome–Perth	184	11 509	84.3	13 652
Cairns–Sydney	312	32 488	88.0	36 904
Cairns–Townsville	448	33 164	58.9	56 274
Canberra–Melbourne	1 855	108 905	56.7	191 959
Canberra–Sydney	2 597	151 305	61.3	246 827
Coffs Harbour–Sydney	533	25 831	68.8	37 527
Coolangatta–Sydney	1 976	166 156	81.9	202 794
Darwin–Kununurra	244	13 100	75.3	17 405
Geraldton–Perth	312	11 910	55.0	21 655
Hamilton Island–Sydney	227	17 256	69.5	24 817
Hobart–Melbourne	1 221	104 428	72.9	143 183
Hobart–Sydney	180	10 595	77.9	13 607
Kalgoorlie–Perth	405	19 920	66.4	30 000
Karratha–Perth	499	28 366	75.9	37 389
Launceston–Melbourne	1 571	70 657	62.0	113 902
Mackay–Rockhampton	339	12 634	34.3	36 798
Melbourne–Coolangatta	570	64 020	83.9	76 335
Melbourne–Perth	878	99 363	80.1	124 049
Melbourne–Sydney	5 404	618 548	71.9	859 891
Perth–Port Hedland	207	11 817	80.2	14 741
Perth–Sydney	571	64 527	79.4	81 268
Sydney–Wagga Wagga	511	18 405	72.1	25 539
Total	36 648	3 200 352	71.2	4 432 719

TABLE I.1 SERVICE FREQUENCY ON SELECTED ROUTES SERVED BY DOMESTIC AIRLINES, SEPTEMBER QUARTERS 1990, 1991 AND 1992 (CONT.)

Route	*Trips*	*Passengers*	*Average load factor (per cent)*	*Seats*
September quarter 1991				
Adelaide–Alice Springs	382	35 683	83.6	42 683
Adelaide–Melbourne	2 808	295 016	82.1	359 483
Adelaide–Perth	725	73 428	76.7	95 734
Adelaide–Sydney	1 636	175 491	82.0	214 013
Alice Springs–Ayers Rock	460	28 916	63.5	45 513
Alice Springs–Cairns	341	20 701	77.7	26 642
Alice Springs–Darwin	459	41 167	77.1	53 394
Alice Springs–Sydney	393	39 229	87.0	45 108
Brisbane–Cairns	1 722	197 466	89.8	219 895
Brisbane–Darwin	305	28 673	81.4	35 239
Brisbane–Hamilton Island	235	14 774	64.9	22 753
Brisbane–Mackay	467	24 538	68.9	35 614
Brisbane–Melbourne	2 023	223 880	86.1	260 023
Brisbane–Rockhampton	757	41 771	71.9	58 096
Brisbane–Sydney	4 749	658 341	85.3	771 795
Brisbane–Townsville	1 101	97 134	83.9	115 728
Broome–Perth	213	12 819	82.7	15 494
Cairns–Sydney	469	67 782	95.9	70 704
Cairns–Townsville	116	8 107	68.3	11 870
Canberra–Melbourne	1 830	128 942	67.0	192 355
Canberra–Sydney	2 893	176 995	64.4	274 837
Coffs Harbour–Sydney	561	26 315	74.5	35 338
Coolangatta–Sydney	2 569	236 819	84.0	281 927
Darwin–Kununurra	208	11 472	72.6	15 794
Geraldton–Perth	231	9 886	63.0	15 692
Hamilton Island–Sydney	349	31 835	80.5	39 563
Hobart–Melbourne	1 488	127 469	76.2	167 282
Hobart–Sydney	193	12 160	64.8	18 765
Kalgoorlie–Perth	381	18 592	67.1	27 722
Karratha–Perth	531	30 135	78.0	38 651
Launceston–Melbourne	1 440	82 216	71.6	114 827
Mackay–Rockhampton	278	9 046	42.8	21 152
Melbourne–Coolangatta	918	96 624	88.4	109 262
Melbourne–Perth	1 734	208 850	78.3	266 617
Melbourne–Sydney	7 364	923 425	77.3	1 194 084
Perth–Port Hedland	246	11 510	67.6	17 027
Perth–Sydney	1 112	132 084	76.1	173 490
Sydney–Wagga Wagga	513	18 932	80.2	23 606
Total	44 200	4 378 223	75.9	5 527 775

TABLE I.1 SERVICE FREQUENCY ON SELECTED ROUTES SERVED BY DOMESTIC AIRLINES, SEPTEMBER QUARTERS 1990, 1991 AND 1992 (CONT.)

Route	*Trips*	*Passengers*	*Average load factor (per cent)*	*Seats*
September quarter 1992				
Adelaide–Alice Springs	388	37 888	84.6	44 785
Adelaide–Melbourne	3 119	272 501	72.4	376 383
Adelaide–Perth	717	75 998	85.2	89 200
Adelaide–Sydney	2 027	181 362	75.9	238 949
Alice Springs–Ayers Rock	512	34 787	71.1	48 927
Alice Springs–Cairns	506	26 248	72.5	36 204
Alice Springs–Darwin	439	37 528	70.9	52 931
Alice Springs–Sydney	376	37 197	83.2	44 708
Brisbane–Cairns	1 787	166 967	84.8	196 895
Brisbane–Darwin	364	35 363	80.8	43 766
Brisbane–Hamilton Island	239	17 686	70.7	25 016
Brisbane–Mackay	661	34 345	77.6	44 259
Brisbane–Melbourne	2 400	220 366	79.3	277 889
Brisbane–Rockhampton	1 032	54 520	78.4	69 541
Brisbane–Sydney	5 579	588 806	73.4	802 188
Brisbane–Townsville	1 145	102 532	84.0	122 062
Broome–Perth	200	11 542	82.0	14 076
Cairns–Sydney	516	57 211	86.3	66 293
Cairns–Townsville	99	7 202	64.4	11 183
Canberra–Melbourne	2 065	128 862	55.7	231 350
Canberra–Sydney	2 949	159 267	56.8	280 400
Coffs Harbour–Sydney	589	25 218	67.6	37 305
Coolangatta–Sydney	3 075	274 777	76.7	358 249
Darwin–Kununurra	230	12 553	74.5	16 850
Geraldton–Perth	243	10 569	62.7	16 856
Hamilton Island–Sydney	196	24 676	78.1	31 595
Hobart–Melbourne	1 441	123 527	76.7	161 052
Hobart–Sydney	410	27 915	67.0	41 664
Kalgoorlie–Perth	395	19 203	67.3	28 533
Karratha–Perth	556	31 280	80.0	39 100
Launceston–Melbourne	1 509	78 485	67.3	116 620
Mackay–Rockhampton	364	11 832	48.2	24 548
Melbourne–Coolangatta	771	85 706	86.9	98 626
Melbourne–Perth	1 354	150 868	84.6	178 331
Melbourne–Sydney	7 820	892 584	75.1	1 188 527
Perth–Port Hedland	234	12 210	76.4	15 982
Perth–Sydney	911	109 822	81.0	135 583
Sydney–Wagga Wagga	545	19 194	75.9	25 289
Total	47 763	4 198 597	74.6	5 631 712

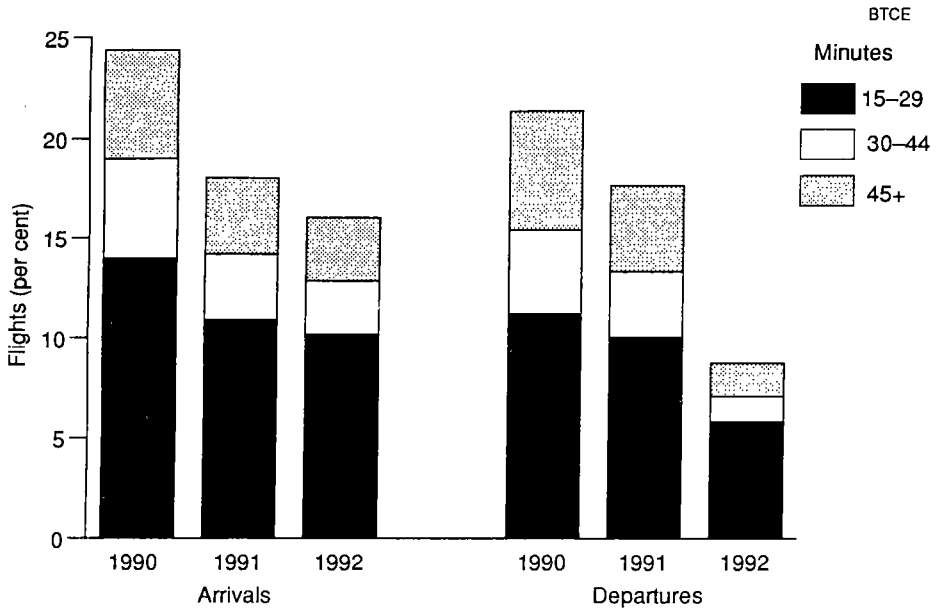
Source BTCE (from DTC aviation statistics database).

APPENDIX II AIRCRAFT ARRIVAL AND DEPARTURE DELAYS AT MAJOR AIRPORTS

By international convention, aircraft arrivals at and departures from the terminal within 15 minutes of the scheduled times are considered to be on time. Arrival and departure delays therefore refer to delays of 15 minutes or more.

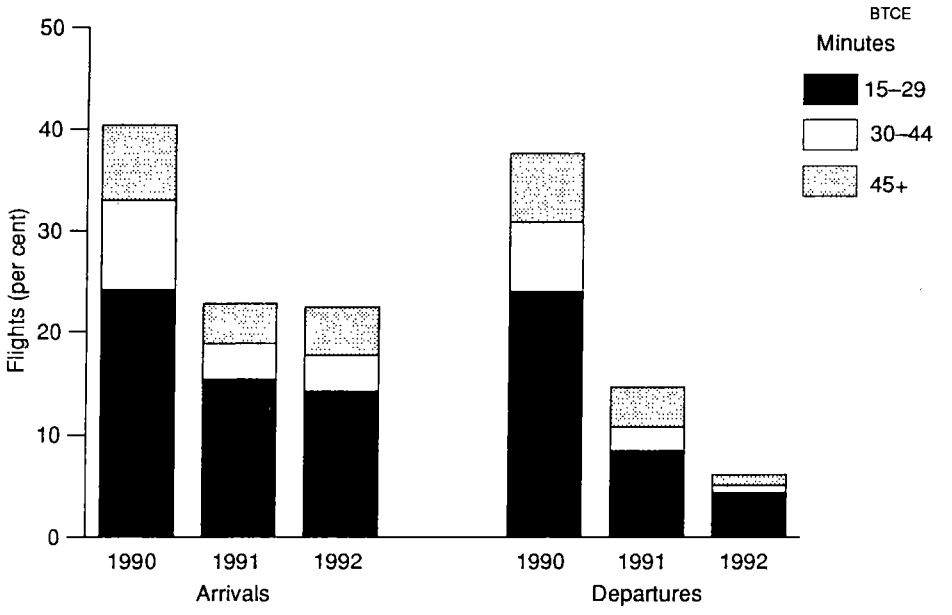
This appendix presents a series of graphs which depict aircraft arrival and departure delays at Sydney, Melbourne, and Brisbane airports for the September quarter in 1990, 1991, and 1992 and at Adelaide and Perth airports for the September quarter in 1991 and 1992. Figures II.1 to II.5 show the percentage of flights which arrived at and departed from the various airports within 15 to 29 minutes, 30 to 44 minutes and 45 minutes or more of the scheduled times. These delay categories were chosen on the basis that delays of varying duration represented differing degrees of inconvenience to consumers. While short delays could often be accommodated in the traveller's schedule, delays of longer duration might have serious consequences.

Most arrival and departure delays were within the 15 to 29 minutes category while delays of 45 minutes or more occurred as frequently as delays in the 30 to 44 minutes category. For all airports there was a significant decrease in the percentage of RPT aircraft arrivals and departures delayed in 1992 when compared with 1991.



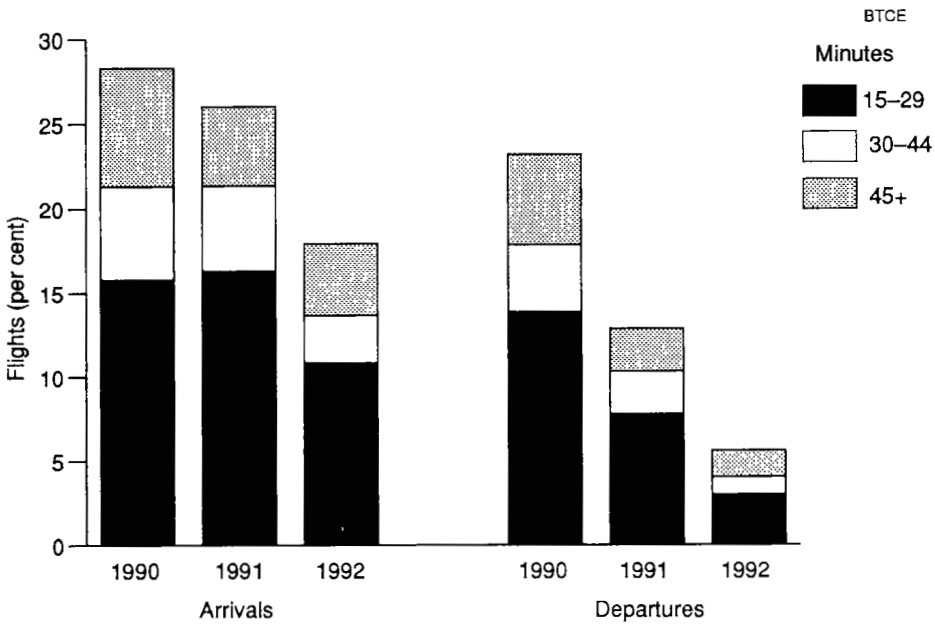
Source BTCE (from CAA flow management database).

Figure II.1 Regular public transport flight delays at Sydney airport, September quarter



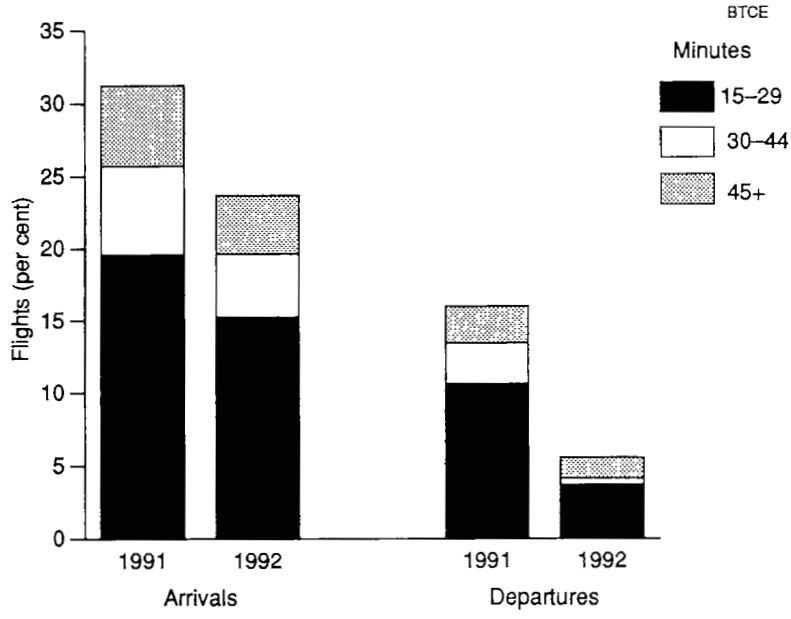
Source BTCE (from CAA flow management database).

Figure II.2 Regular public transport flight delays at Melbourne airport, September quarter



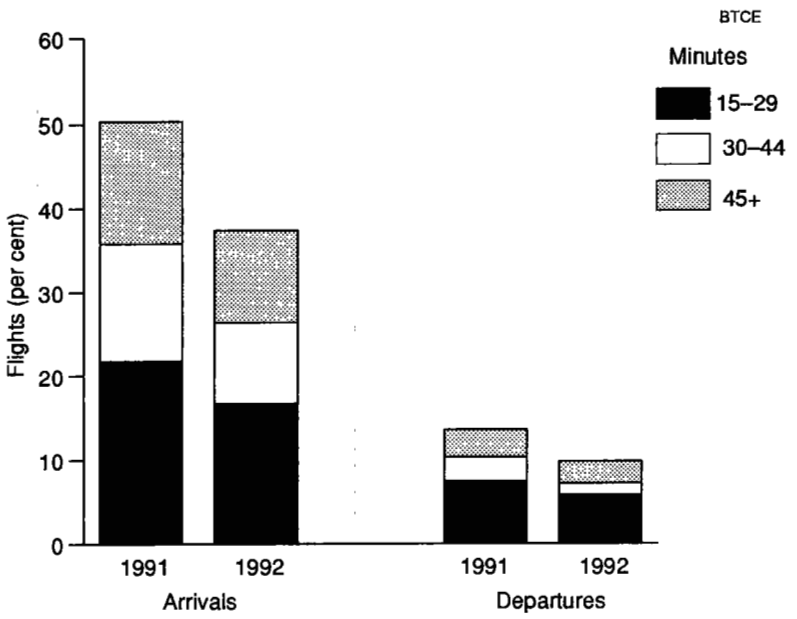
Source BTCE (from CAA flow management database).

Figure II.3 Regular public transport flight delays at Brisbane airport, September quarter



Source BTCE (from CAA flow management database).

Figure II.4 Regular public transport flight delays at Adelaide airport, September quarter



Source BTCE (from CAA flow management database).

Figure II.5 Regular public transport flight delays at Perth airport, September quarter

APPENDIX III INDUSTRY AND AIRLINE PERFORMANCE DATA

TABLE III.1 AIRLINE INDUSTRY OUTPUT

(thousand revenue tonne-kilometres)

Year ending 30 June	*Domestic*	*Qantas*	*Total*
1982	1 048 435	1 858 886	2 907 321
1983	981 412	1 881 067	2 862 479
1984	1 027 053	1 923 925	2 950 978
1985	1 089 960	2 218 755	3 308 715
1986	1 173 201	2 372 917	3 546 118
1987	1 230 762	2 797 048	4 027 810
1988	1 351 191	3 111 415	4 462 606
1989	1 397 360	3 455 365	4 852 725
1990	992 836	3 649 327	4 642 163
1991	1 446 293	3 721 114	5 167 407
1992[a]	1 870 330	3 542 000	5 412 330

a. BTCE estimate.

Sources DTC Aviation Statistics, Qantas Annual Reports.

TABLE III.2 AIRLINE PASSENGER NUMBERS, 1981–82 TO 1991–92

(million passengers)

Year ending 30 June	*Ansett*	*Australian*	*Compass*	*Eastwest*	*Domestic*	*Qantas*
1982	5.01	4.84	–	0.44	11.40	1.99
1983	4.43	4.33	–	0.48	10.33	2.17
1984	4.41	4.43	–	0.63	10.60	2.12
1985	4.74	4.56	–	0.83	11.34	2.45
1986	4.86	5.00	–	0.98	12.10	2.59
1987	5.32	5.11	–	0.91	12.51	3.02
1988	5.93	5.61	–	0.95	13.65	3.45
1989	5.90	6.04	–	0.89	14.01	4.00
1990	3.92	4.22	–	0.50	9.91	4.23
1991	5.52	5.89	0.51	0.83	15.00	4.14
1992	7.51	7.31	0.94	1.05	17.95	4.10

Sources DTC, Qantas Annual Reports, BTCE estimates.

TABLE III.3 AIRLINE PASSENGER REVENUES

($ million)

Financial year	*Ansett*	*Australian*	*Compass*	*Eastwest*	*Qantas*
1981–82	524	438	–	20	851
1982–83	558	472	–	28	993
1983–84	627	533	–	44	1 033
1984–85	720	588	–	67	1 166
1985–86	789	692	–	89	1 435
1986–87	904	763	–	92	1 853
1987–88	1 066	887	–	103	2 135
1988–89	1 196	1 043	–	110	2 385
1989–90	956	846	–	77	2 425
1990–91	1 362	1 120	129	138	2 525
1991–92	1 400	1 270	173	170	2 415

Sources IAFC, Qantas Annual Reports, BTCE estimates.

TABLE III.4 REAL AIRLINE PASSENGER REVENUES

($ million, 1982 dollars)

Financial year	*Ansett*	*Australian*	*Compass*	*Eastwest*	*Qantas*
1981–82	524	438	–	20	851
1982–83	501	423	–	25	890
1983–84	526	447	–	37	867
1984–85	579	473	–	54	938
1985–86	586	513	–	66	1 066
1986–87	614	518	–	63	1 258
1987–88	675	561	–	65	1 350
1988–89	705	614	–	65	1 406
1989–90	522	462	–	42	1 324
1990–91	706	581	67	71	1 308
1991–92	712	646	88	86	1 228

Sources IAFC, Qantas Annual Reports, BTCE estimates.

TABLE III.5 QANTAS GROUP REVENUE AND PERFORMANCE DATA

Financial year[a]	*Passenger revenue ($M)*	*Total revenue ($M)*	*Revenue passenger-kilometres (million RPK)*	*Passenger revenue per RPK (¢ per RPK)*	*Consumer price index (1989–90 = 100)*	*Real revenues per RPK (¢ per RPK)*
1980–81	785	1 067	15 282	5.14	49	10.40
1981–82	851	1 168	14 590	5.83	55	10.69
1982–83	993	1 340	14 993	6.62	61	10.89
1983–84	1 033	1 387	14 584	7.08	65	10.90
1984–85	1 166	1 641	16 716	6.98	68	10.29
1985–86	1 435	2 012	17 613	8.15	74	11.08
1986–87	1 853	2 563	21 009	8.82	80	10.98
1987–88[b]	2 135	3 085	23 570	9.06	86	10.50
1988–89	2 385	3 266	26 546	8.98	93	9.70
1989–90	2 425	3 606	27 097	8.95	100	8.95
1990–91	2 525	3 861	26 899	9.39	105	8.91

a. In 1988, the financial year changed from 12 months ending 31 March to ending 30 June.

b. BTCE estimate from 15-month data.

Sources Qantas Annual Reports, ABS, BTCE estimates.

TABLE III.6 PROPENSITY TO TRAVEL

Year ending 30 June	*Short-term foreign visitor arrivals*	*Estimated domestic one-way trips by foreign visitors*	*Estimated domestic one-way trips by Australian residents*	*Short-term departures by Australian residents*	*Australian population*	*Estimated domestic return journeys per head by Australian residents*	*Estimated international return journeys per head by Australian residents*
1982	950 172	712 629	10 537 475	1 280 811	15 184 200	0.29	0.08
1983	938 200	703 650	9 768 218	1 245 200	15 393 500	0.27	0.08
1984	1 008 536	756 402	10 122 831	1 412 862	15 579 400	0.28	0.09
1985	1 132 689	849 517	10 588 528	1 505 123	15 788 300	0.29	0.10
1986	1 417 219	1 062 914	10 884 224	1 535 127	16 018 400	0.29	0.10
1987	1 773 451	1 330 088	11 279 053	1 617 860	16 253 600	0.29	0.10
1988	2 239 490	1 679 618	11 929 792	1 693 085	16 518 400	0.31	0.10
1989	2 069 433	1 552 075	13 217 942	1 983 047	16 803 000	0.33	0.12
1990	2 206 962	1 655 222	13 035 983	2 165 480	17 044 700	0.33	0.13
1991	2 360 297	1 770 223	13 361 861	2 094 864	17 292 000	0.33	0.12
1992	2 519 700	1 889 775	16 048 525	2 523 100	17 528 900	0.39	0.14

Sources ABS, BTCE estimates.

TABLE III.7 MODAL SHARE OF INTERSTATE OVERNIGHT TRAVEL

(per cent)

Financial year	*Air*	*Bus or coach*	*Private vehicle*	*Rented or hired*	*Ship or ferry*	*Other or not stated*
1984–85	28	8	55	1	4	4
1985–86	27	9	56	1	4	3
1986–87	27	10	55	1	4	3
1987–88	25	10	56	2	4	3
1988–89	25	13	53	2	3	4
1989–90	21	11	57	2	4	4
1990–91	29	8	54	2	3	3
1991–92	37	7	50	1	3	2

Note Totals do not add to 100 because of rounding.

Source Bureau of Tourism Research.

TABLE III.8 DOMESTIC AIRLINES REVENUE PASSENGER-KILOMETRES

(thousand revenue passenger-kilometres)

Financial year	*Ansett Group*[a]	*Ansett*	*Australian*[b]	*Compass*	*Eastwest*	*Total domestic*
1981–82	5 405 672	4 701 752	4 513 726	0	209 560	10 155 379
1982–83	4 898 548	4 198 422	4 138 600	0	248 094	9 327 206
1983–84	5 014 196	4 278 743	4 266 504	0	355 068	9 684 589
1984–85	5 413 110	4 651 595	4 416 290	0	503 715	10 397 723
1985–86	5 674 131	4 839 812	4 917 620	0	643 492	11 293 375
1986–87	6 190 687	5 371 638	5 154 176	0	632 916	12 046 635
1987–88	6 880 088	5 966 137	5 695 974	0	664 282	13 267 186
1988–89	6 994 478	6 020 233	6 096 614	0	641 605	13 732 696
1989–90	5 083 511	4 291 475	4 407 968	0	408 683	9 989 469
1990–91	7 176 502	6 049 046	5 892 485	707 893	728 089	14 504 969
1991–92	9 004 893	8 211 041	7 869 904	1 240 979	965 793	19 081 569

a. Ansett, Ansett Express, Ansett NT, Ansett WA.

b. Includes Australian Airlink.

Source DTC.

TABLE III.9 DOMESTIC AIRLINES MARKET SHARES

(per cent of revenue passenger-kilometres)

Financial year	*Ansett Group*[a]	*Ansett*	*Australian*[b]	*Compass*	*Eastwest*
1981–82	53	46	44		2
1982–83	53	45	44		3
1983–84	52	44	44		4
1984–85	52	45	42		5
1985–86	50	43	44		6
1986–87	51	45	43		5
1987–88	52	45	43		5
1988–89	51	44	44		5
1989–90	51	43	44		4
1990–91	49	42	41	5	5
1991–92	47	43	41	7	5

a. Ansett, Ansett Express, Ansett NT, Ansett WA.

b. Includes Australian Airlink.

Source DTC.

TABLE III.10 AUSTRALIAN AIRLINES GROUP FINANCIAL PERFORMANCE, 1982–92

Financial year	Revenue[a] ($M)	Costs ($M)	Profit before tax[b] ($M)	Interest[c] ($M)	Abnormals and extraordinaries ($M)	EBIT ($M)	Assets ($M)	Ratio of EBIT to assets (per cent)
1981–82	516	519	(3)	27	7	24	526	5
1982–83	552	562	(10)	34	7	24	640	4
1983–84	641	637	4	27	12	31	578	5
1984–85	758	729	29	26	1	55	627	9
1985–86	871	833	38	30	7	68	752	9
1986–87	947	923	24	48	6	72	1 339	5
1987–88	1 140	1 073	77	58	10	125	1 546	9
1988–89	1 263	1 149	114	51	(1)	165	1 563	11
1989–90	1 184	1 246	(62)	84	18	22	1 863	1
1990–91	1 398	1 285	113	99	107	212	2 013	11
1991–92	1 545	1 614	(69)	87	(29)	18	2 149	1

EBIT Earnings before interest and tax (including abnormal and extraordinary items)

Note Numbers in brackets are negative.

a. Sales revenue, interest revenue and other revenue; excluding abnormal items.

b. Includes abnormal items, excludes extraordinary items.

c. Includes amortised interest on aircraft loans for 1981–82 and 1982–83. From 1983–84 onwards, interest on aircraft purchases was no longer capitalised. For effects, see page 22 of 1983–84 *Annual Report*. From 1986–87 net interest paid on aircraft financial leases included, since balance sheet reflects net situation of borrowing to finance leased assets.

Sources Annual Reports.

TABLE III.11 ANSETT GROUP FINANCIAL PERFORMANCE, 1982–92

Financial year	Consolidated income ($M)	Costs ($M)	Profit before tax[a] ($M)	Interest ($M)	Abnormals and extraordinaries ($M)	EBIT[b] ($M)	Total assets ($M)	Ratio of EBIT to assets (per cent)
1981–82	959	916	43	37	26	106	1 026	10
1982–83	1 012	954	58	48	10	116	1 182	10
1983–84	1 276	1 223	53	71	99	223	1 261	18
1984–85	1 271	1 181	90	83	7	180	1 603	11
1985–86	1 566	1 414	152	79	19	250	1 965	13
1986–87	1 850	1 695	155	92	50	297	2 285	13
1987–88	1 964	1 833	131	108	152	391	2 899	13
1988–89	2 204	2 066	139	164	(78)	225	3 795	6
1989–90	2 033	2 082	12	231	38	281	3 935	7
1990–91	2 386	2 434	(48)	224	(183)	(7)	3 951	(0)
1991–92[c]						23	4 000	1

Note Numbers in brackets are negative.

a. Before abnormal items.

b. Earnings before interest and tax, including abnormal and extraordinary items.

c. BTCE estimate.

Sources Annual Reports.

TABLE III.12 QANTAS GROUP FINANCIAL PERFORMANCE, 1982–92

Financial year	Total revenues ($M)	Costs ($M)	Profit before tax[a] ($M)	Interest[b] ($M)	Abnormals and extraordinaries ($M)	EBIT ($M)	Assets ($M)	Ratio of EBIT to assets (per cent)
1981–82	1 125	1 131	(6)	30	14	23	839	3
1982–83	1 251	1 298	(70)	27	(23)	43	819	(5)
1983–84	1 375	1 316	60	25	2	86	887	10
1984–85	1 576	1 513	212	22	149	234	1177	20
1985–86	1 914	1 869	28	25	(17)	52	1655	3
1986–87	2 297	2 192	115	43	10	157	2022	8
1987–88[c]	3 085	2 644	219	51	66	270	2775	10
1988–89	3 266	3 089	226	86	49	312	4570	7
1989–90	3 606	3 726	(18)	155	102	144	5288	3
1990–91	3 887	4 045	81	228	240	309	6007	5
1991–92	4 036	3 933	148	219	45	367	6488	6

EBIT Earnings before interest and tax

Note Numbers in brackets are negative.

a. Including abnormal items.

b. Including finance charges.

c. 1987–88 estimated from 15-month data.

Sources Annual Reports.

TABLE III.13 AIRLINE CAPACITY AVAILABLE, 1981–82 TO 1991–92

Year ended 30 June		*Ansett Group*[a]	*Australian*	*Compass*	*Eastwest*	*Qantas*
1982	Thousand seat-kilometres	7 644 307	6 366 173		384 979	23 328 464
	Thousand tonne-kilometres	861 197	704 553		36 751	2 986 728
1983	Thousand seat-kilometres	7 169 681	6 098 082		404 660	24 931 714
	Thousand tonne-kilometres	813 411	682 098		38 319	3 202 591
1984	Thousand seat-kilometres	7 032 934	5 794 723		545 834	24 779 097
	Thousand tonne-kilometres	832 140	661 437		50 344	3 189 079
1985	Thousand seat-kilometres	7 354 831	5 955 602		753 789	26 553 411
	Thousand tonne-kilometres	861 890	679 241		79 049	3 445 972
1986	Thousand seat-kilometres	7 949 018	6 580 622		923 805	28 641 271
	Thousand tonne-kilometres	945 789	752 746		97 069	3 745 224
1987	Thousand seat-kilometres	8 662 882	6 964 119		955 073	32 095 334
	Thousand tonne-kilometres	1 048 963	811 502		100 395	4 224 699
1988	Thousand seat-kilometres	9 280 032	7 300 114		1 013 377	34 398 817
	Thousand tonne-kilometres	1 131 951	875 315		104 267	4 505 914
1989	Thousand seat-kilometres	9 495 064	7 598 022		893 232	39 221 735
	Thousand tonne-kilometres	1 159 544	916 962		92 383	5 167 886
1990	Thousand seat-kilometres	6 924 763	5 821 846		544 923	41 468 532
	Thousand tonne-kilometres	849 084	658 212		56 219	5 741 830
1991	Thousand seat-kilometres	10 114 463	8 134 012	1 186 622	1 048 313	43 563 271
	Thousand tonne-kilometres	1 282 091	979 048	155 199	110 398	6 028 323
1992	Thousand seat-kilometres	11 604 690	9 270 159	1 728 704	1 401 162	
	Thousand tonne-kilometres	1 518 094	1 131 502	217 722	141 576	

a. Ansett, Ansett Express, Ansett NT, Ansett SA, Ansett WA.

Sources DTC, Qantas Annual Report.

TABLE III.14 AIRLINE COSTS PER TONNE-KILOMETRE AVAILABLE, 1990

Airline	*Country*	*Cost per tonne-kilometre available (US cents)*	*Index of modified cost per tonne-kilometre available (outputs and inputs) (base BA = 100)*
Ansett[a,b]	Australia	174.4	
Australian[a]	Australia	137.7	
Qantas	Australia	49.0	85
Air Canada	Canada	49.1	63
Canadian Airlines International	Canada	45.1	58
Lufthansa	Germany	66.8	83
Cathay Pacific	Hong Kong	39.1	
Garuda	Indonesia	36.0	
Alitalia	Italy	79.1	104
All Nippon Airways	Japan	83.5	
Japan Airlines (JAL)	Japan	60.1	121
Malaysian	Malaysia	37.3	
Air New Zealand[a]	New Zealand	47.4	
Korean Air	Republic of Korea	36.7	
SAS	Scandinavia	108.6	115
Singapore Airlines (SIA)	Singapore	33.6	51
Iberia	Spain	71.6	89
Swissair	Switzerland	89.1	
Thai Airways International (Thai)	Thailand	44.2	
British Airways	United Kingdom	63.1	100
Alaska	USA	51.2	
American	USA	51.2	57
Delta	USA	47.0	
Northwest	USA	40.1	
Pan American	USA	43.7	59
TWA	USA	43.7	63
United	USA	48.3	

a. BTCE estimates.

b. Ansett data includes approximately 40 per cent non-airline operations.

Sources ICAO, Financial Data, 1990 (unless otherwise stated above).

TABLE III.15 SELECTED WORLD AIRLINES FINANCIAL PERFORMANCE, FINANCIAL YEARS 1990 AND 1991

Airline	*Country*	*Operating result (US$M)*	*Profit (loss) before income tax[a] (US$M)*	*Interest (US$M)*	*EBIT (US$M)*	*Total assets (US$M)*	*Return on assets (per cent)*
1990 financial years							
Eastern	USA	(533)	(1 126)	225	(901)	2 704	(33)
Continental	USA	(242)	(1 236)	226	(1 010)	3 092	(33)
Pan American	USA	(490)	(637)	154	(483)	2 069	(23)
US Air	USA	(543)	(590)	97	(493)	6 478	(8)
Iberia	Spain	(108)	(257)	161	(96)	3 730	(3)
Delta	USA	(235)	(241)	57	(184)	7 446	(2)
Air Canada	Canada	(35)	(84)	41	(43)	3 555	(1)
SAS	Scandinavia	238	(107)	43	(64)	5 888	(1)
Swissair	Switzerland	(77)	19	(18)	1	4 388	0
Canadian	Canada	(55)	(70)	73	3	2 199	0
Alitalia	Italy	(37)	(95)	108	13	3 126	0
American	USA	68	(97)	166	69	12 568	1
Northwest	USA	(142)	(10)	88	78	7 273	1
JAL	Japan	193	183	(26)	157	11 832[b]	1
Lufthansa	Germany	(135)	5	113	118	8 172	1
Australian[c,d]	Australia	na	(49)	66	17	1 470	1
Korean Air	Korea	144	(9)	97	88	4 053	2
Qantas[e]	Australia	(519)	(14)	122	114	4 403	3
United	USA	(54)	167	121	288	8 012	4
British Airways	United Kingdom	303	238	64	302	7 893	4
All Nippon	Japan	179	163	152	315	7 821	4
TWA	USA	(162)	(232)	369	137	3 301	4
Federal Express	USA	424	234	196	430	6 288	7
Ansett[c]	Australia	138	9	182	222	3 105	7
Malaysia Airlines	Malaysia	(13)	108	40	148	1 594	9
SIA	Singapore	369	633	(105)	528	4 967	11
Thai Airways	Thailand	321	262	69	331	3 028	11
Cathay Pacific	Hong Kong	347	438	223	661	5 134	13

TABLE III.15 SELECTED WORLD AIRLINES FINANCIAL PERFORMANCE, FINANCIAL YEARS 1990 AND 1991 (Cont.)

Airline	*Country*	*Operating result (US$M)*	*Profit (loss) before income tax[a] (US$M)*	*Interest (US$M)*	*EBIT (US$M)*	*Total assets (US$M)*	*Return on assets (per cent)*
1991 financial years							
Iberia	Spain	(185)	(504)	206	(298)	4 544	(7)
Continental	USA	(269)	(340)	131	(209)	3 233	(6)
Air Canada	Canada	(209)	(313)	82	(231)	3 895	(6)
Canadian	Canada	(130)	(197)	88	(109)	1 888	(6)
United	USA	(491)	(513)	119	(394)	9 907	(4)
Delta	USA	(266)	(366)	118	(248)	9 102	(3)
US Air	USA	(202)	(345)	168	(176)	6 575	(3)
Lufthansa	Germany	(215)	(267)	207	(60)	8 568	(1)
American	USA	18	(230)	192	(37)	15 180	(0)
Ansett[f,g]	Australia	140	(38)	176	(5)	3 102	(0)
TWA[h]	USA	(348)	(325)	334	9	2 702	0
Swissair	Switzerland	(55)	44	(5)	39	4 268	1
Northwest	USA	(60)	1	173	175	8 006	2
Federal Express	USA	321	(40)	195	156	6 051	3
JAL	Japan	(97)	21	37	58	1 887	3
Malaysian Airlines	Malaysia	47	42	36	78	1 951	4
Qantas	Australia	(66)	64	179	243	4 715	5
British Airways	United Kingdom	596	494	152	646	9 098	7
SAS	Scandinavia	205	156	138	293	3 926	7
Thai Airways	Thailand	147	200	110	310	3 330	9
Australian[f,i]	Australia	na	89	78	166	1 580	11
SIA	Singapore	409	639	100	739	5 739	13

EBIT Earnings before income tax, extraordinaries and interest
na Not available

Note Numbers in brackets are negative.

(Continued on next page)

TABLE III.15 SELECTED WORLD AIRLINES FINANCIAL PERFORMANCE, FINANCIAL YEARS 1990 AND 1991 (Cont.)

a. Excluding abnormals.

b. ICAO figure of US$639 million disregarded. Source: JAL Annual Report, 1990–91 shows total consolidated assets of ¥1.6 trillion or approximately US$11 832 million.

c. Converted to US dollars at an exchange rate of US$78.9 to $A100.

d. Including $A18 million (US$14 million) in abnormal profits.

e. Figures are for Qantas airlines as opposed to Qantas Group and therefore differ from those presented in table 8.12.

f. Converted to US dollars at an exchange rate of US$78.5 to $A100.

g. $A183 million in abnormal losses included (US$144 million).

h. Excluding $361 million in extraordinary earnings.

i. $A107 million (US$84 million) in abnormal profits included.

Sources ICAO, Financial Data, Annual Reports (Ansett and Australian).

APPENDIX IV DOUGLAS AND MILLER SCHEDULE DELAY MODEL

The full form of the model developed by Douglas and Miller (1974) to calculate schedule delay is the following:

$$\text{Schedule delay} = \text{Frequency delay} + \text{Stochastic delay}$$

where:

$$\text{Frequency delay} = 92^{*}(F^{-0.456})$$
$$\text{Stochastic delay} = 0.455^{*}(Y^{-0.645})^{*}(X^{-1.79})^{*}I$$

and F is the daily flight frequency *(total flights per quarter divided by days in quarter)*; Y is the ratio of flight demand mean to its standard deviation *[mean passengers per flight divided by (4.12 times the square root of mean passengers per flight)]*; X is relative capacity *[(mean aircraft capacity minus mean passengers per flight) divided by (4.12 times the square root of mean passengers per flight)]*; and I is the average interval between flights[1] *(total available scheduled time per quarter divided by the total flights per quarter).*

In simple terms this model describes schedule delay as a function of flight frequency and load factor. As flight frequency increases, frequency delay decreases. As load factor increases, stochastic delay increases. However, whereas the rate of change in schedule delay resulting from flight frequency increase is logarithmic, schedule delay increases exponentially as load factor rises. These relationships are illustrated in figures IV.1 and IV.2.

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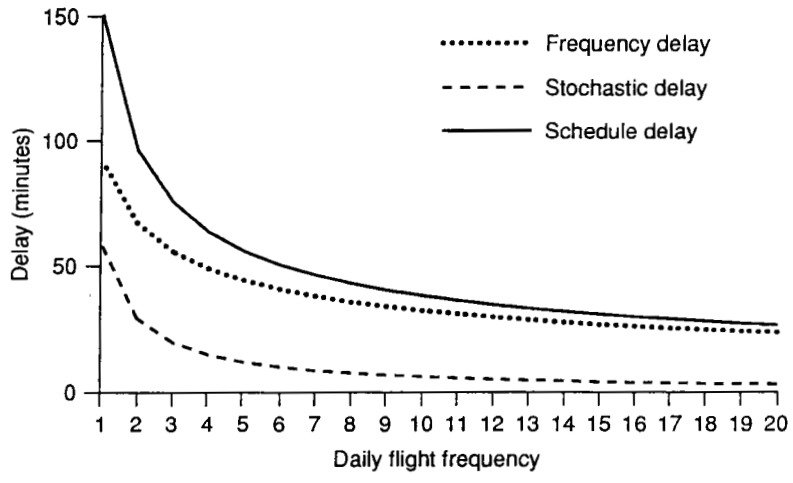
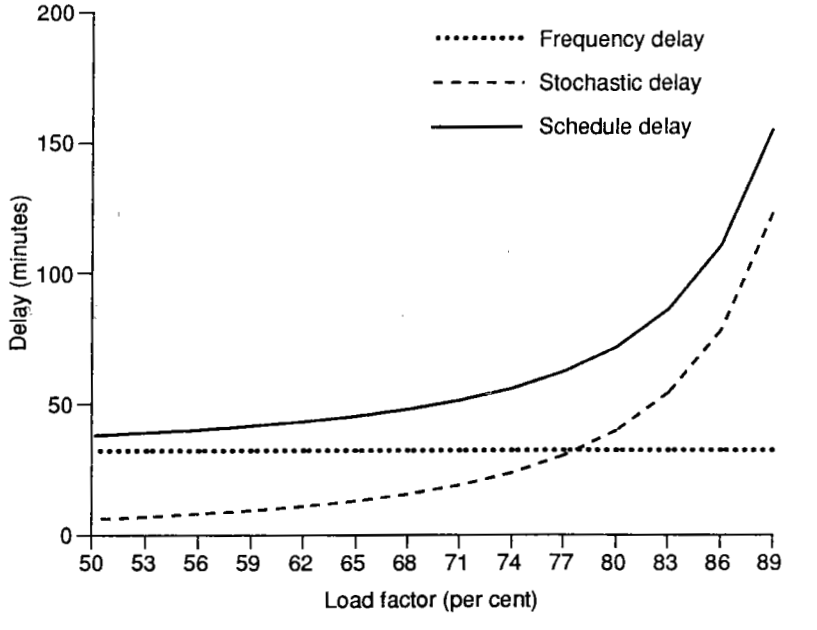
1. In deriving the average interval between flights from quarterly data an assumption is made that for the top 10 routes, flights are offered on average over a 12-hour day. For all other routes an average 8-hour day is assumed.



Source BTCE estimates.

Figure IV.1 Variation in schedule delay (and its components) holding load factor constant at 50 per cent and varying daily flight frequency



Source BTCE estimates.

Figure IV.2 Variation in schedule delay (and its components) holding daily flight frequency constant at ten flights per day and varying load factor

APPENDIX V MODEL USED TO SIMULATE DEMAND FOR AVIATION PASSENGER SERVICES

A simplified version of the equations used for the purpose of simulating aviation passenger demand over 1990 to 1992 is as follows:

$$DOMPAS = DOMPAS1 + DOMPAS2$$
$$DOMPAS1 = 0.75*TOTINPAS$$
$$DOMPAS2 = \exp(4.36*\ln CONST + 1.11*\ln RGNF - 0.49*\ln RMED + 0.08*\ln RPPI - 0.016*DA11 - 0.018*DA21 + 0.05*DA31)$$

where abbreviations are as follows:

CONST	Constant
DA11	Seasonal dummy = 1 in the March quarter
DA21	Seasonal dummy = 1 in the June quarter
DA31	Seasonal dummy = 1 in the September quarter
DOMPAS	Total number of passengers travelling on the domestic airline network
DOMPAS1	Number of foreign visitors travelling on the domestic airline network
DOMPAS2	Number of Australians travelling on the domestic airline network
exp	Exponential function
ln	Natural logarithm
RGNF	Real seasonally-adjusted non-farm gross domestic product (which is our income proxy and thereby provides an indicator of the effect of the business cycle on demand as well as the underlying rate of demand growth)
RMED	Until December 1990, an estimate of average fares paid based on an estimate of the real air fare for medium-distance travel (about 1000 km); after 1990, an estimate of average fares paid using Prices Surveillance Authority data
RPPI	Real petrol price index (a proxy for relative competitiveness of land transport)
TOTINPAS	Number of foreign visitors to Australia

Validation of the model

Over the period in which it was estimated (1978 to 1987) this model tracked extremely well. However, it has been having some difficulty in tracking demand since early 1989. Figure V.1 shows how the model tracked over the estimation period.

Figure V.2 shows how the model has been tracking in recent times and also depicts the simulation of what would have happened to demand had there been no aviation reform.

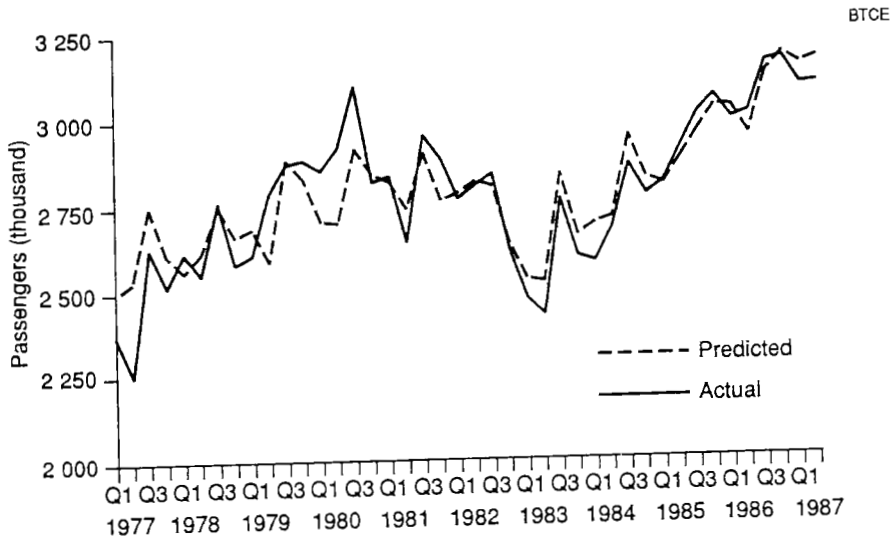
In the absence of a better model we have explored the possible reasons why the current model has failed to track actual demand. There were four distinct episodes as follows:

(1) There was a slump in demand in early 1989 which might be attributable to a reaction to the boom created by the Bicentennial and Expo.

(2) The model could not be expected to track the capacity restrictions created by the pilots' dispute in the second half of 1989 and the first quarter of 1990.

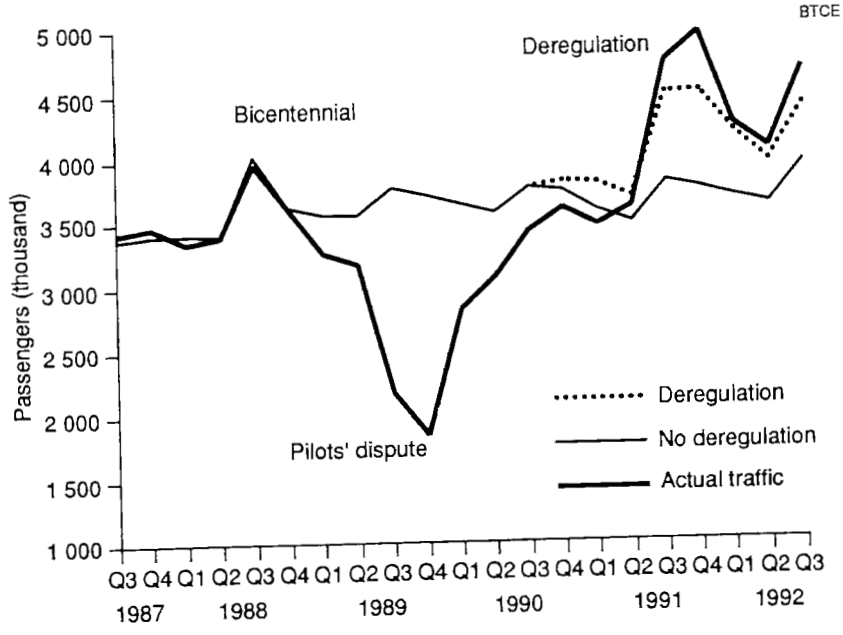
(3) There was a continued slackness in demand after the restoration of capacity subsequent to the pilots' dispute which was not explicable by previous experience of demand responsiveness to price and income levels or by any reduction in foreign visitors. This demand slump lasted until the middle of 1991. The slackness of demand could be attributed to some lingering effects of the dispute after the airlines restored capacity. Travellers may have found, at least temporarily, other ways of getting about and getting business done without travelling. This hypothesis is corroborated by a gradual convergence in the differences between predicted and actual outcomes over 1991. Another possible explanation is that the recession was having a more severe impact on demand than might be expected from actual reductions in incomes in the macro-economy (but this does not explain what happened in the second half of 1991 — see below).

(4) Despite the recession, there was a boom in demand in the second half of 1991. This might have a number of explanations. First, and partly because of the nature of the discounts offered, the mix of passengers would have switched markedly towards leisure passengers. The change in mix would have taken the model outside of the range over which it was estimated. Leisure passengers are in any case more price-responsive than business travellers. Second, air fares may have passed a threshold beyond which an increasing number of travellers were induced to switch transport modes on account of air being for the first time regarded as cheaper than alternative modes. Third, travellers may have regarded the air fares as a bargain which could not last and on this account either increased their purchases or brought forward future travel plans. Fourth,



Source BTCE.

Figure V.1 Tracking ability of demand model over the estimation period of 1978 to 1987



Source BTCE.

Figure V.2 Tracking ability of demand model in recent times, 1987 to 1991

the extensive publicity associated with the discount war may have made the public more air travel conscious and thereby induced extra ticket purchases. These explanations appear more plausible than any argument that the effect of the recession was being overestimated or that seasonal peaks were underestimated.

Overall, however, we believe that adopting this model is likely to provide a conservative estimate of the demand response to deregulation discounting, as most of any potential bias in the model appears to be towards underestimating price responsiveness.

APPENDIX VI SENSITIVITY ANALYSIS OF KEY PARAMETERS OF THE WELFARE MODEL

This appendix presents the results of a sensitivity analysis of key parameters of the model used to derive estimates of welfare change. These results can be used to adjust the findings presented in chapter 9.

The model used to determine changes in net economic welfare resulting from domestic aviation reforms is as follows:

$$\sum_i \sum_j \sum_k \sum_l \Delta \text{Schedule delay}_{ijk} * \text{Existing passengers}_{ijkl} * \text{Value of time}_l$$

$$+ 1/2 \sum_i \sum_j \sum_k \sum_l \Delta \text{Schedule delay}_{ijk} * \text{New passengers}_{ijkl} * \text{Value of time}_l$$

$$+ \sum_i \sum_j \sum_k \Delta \text{Travel time}_{ijk} * \text{Passengers}_{ijk} * \text{Value of time}_k$$

$$+ \sum_i \Delta \text{Air fare}_i * \text{Existing passengers}_i$$

$$+ 1/2 \sum_i \Delta \text{Air fare}_i * \text{New passengers}_i$$

$$+ \sum_i \text{Producer gains from reduced costs}_i$$

$$- \sum_i \text{Producer losses}_i$$

where: *i* is the post-deregulation quarter in which welfare change is achieved; *j* is domestic city pair; *k* is direction of travel (city 1 to city 2, or city 2 to city 1); and *l* is purpose of travel (business or leisure).

The structure of this net welfare sum model coupled with the disaggregated presentation of findings in chapter 9 allows for easy application of sensitivity bounds for most of the variables in the model.

However, there are two areas where a separate sensitivity analysis would be enlightening. These are: firstly, in varying the parameters of the model used to determine schedule delay; and secondly in varying the value of time for business and leisure passengers. These two sensitivity analyses are presented below.

TABLE VI.1 SENSITIVITY ANALYSIS ILLUSTRATING THE EFFECT OF A ±20 PER CENT VARIATION IN THE PARAMETERS OF THE SCHEDULE DELAY MODEL

($ million)

Period	*Base case: welfare change from schedule delay variations*	F *exponent*		Y *exponent*		X *exponent*	
		+20%	*–20%*	*+20%*	*–20%*	*+20%*	*–20%*
1991Q1	10.6	10.7	10.5	9.7	11.7	13.5	8.3
1991Q2	5.8	5.9	5.7	5.5	6.2	6.3	5.4
1991Q3	–1.0	–1.0	–1.0	–0.4	–1.7	–5.6	1.9
1991Q4	–1.0	–0.9	–1.2	–0.3	–1.7	–4.6	1.6
1992Q1	3.5	3.6	3.1	3.7	3.2	–0.3	5.6
1992Q2	5.5	5.7	5.3	5.5	5.6	4.7	6.2
1992Q3	2.9	2.9	2.7	3.0	2.7	1.0	4.2

Source BTCE estimates.

Sensitivity analysis varying the parameters of the schedule delay formula

Changes in schedule delay are calculated using Douglas and Miller's (1974) formula:[1]

$$\text{Schedule delay} = (92 \bullet F^{-0.456}) + (0.455 * Y^{-0.645} * X^{-1.79} * I)$$

where F is daily flight frequency; Y is the ratio of flight demand mean to its standard deviation; X is relative capacity; and I is average interval between flights.

The effect of a ±20 per cent sensitivity analysis of the F, Y and X exponents of the schedule delay formula on the magnitude of welfare gain (or loss) from changes in schedule delay is presented in table VI.1

Sensitivity analysis varying travellers' value of time

The effect of a ±20 per cent sensitivity analysis of the values of travel time delay incurred by business and leisure travellers on the magnitude of welfare gain (or loss) from changes in schedule delay and access to direct flights is presented in table VI.2.

1. A complete explanation of Douglas and Miller's schedule delay model is given in appendix IV.1.

TABLE VI.2 SENSITIVITY ANALYSIS ILLUSTRATING THE EFFECT OF A ±20 PER CENT VARIATION IN THE VALUE OF TRAVEL TIME DELAY

($ million)

Period	*Base case: welfare change from schedule delay variations*	*Value of business travel time*		*Value of leisure travel time*	
		+20%	*–20%*	*+20%*	*–20%*
1991Q1	10.6	10.9	10.4	12.5	8.7
1991Q2	5.8	6.2	5.4	6.6	5.0
1991Q3	–1.0	–0.4	–1.7	–1.9	–0.2
1991Q4	–1.0	–0.4	–1.6	–1.7	–0.2
1992Q1	3.5	4.2	2.7	3.4	3.5
1992Q2	5.5	6.2	4.9	6.0	5.1
1992Q3	2.9	3.6	2.2	2.7	3.0

Period	*Base case: welfare change from access to direct services*	*Value of business travel time*		*Value of leisure travel time*	
		+20%	*–20%*	*+20%*	*–20%*
1991Q1	1.3	1.4	1.1	1.3	1.2
1991Q2	1.5	1.7	1.3	1.6	1.4
1991Q3	1.3	1.5	1.2	1.4	1.2
1991Q4	1.6	1.8	1.4	1.7	1.5
1992Q1	1.8	2.1	1.6	1.9	1.7
1992Q2	1.8	2.1	1.6	2.0	1.7
1992Q3	1.3	1.4	1.1	1.4	1.2

Source BTCE estimates.

GLOSSARY

Aerocost An aircraft costing model developed by the Bureau of Transport and Communications Economics.

Air Service Agreements (ASAs) Agreements negotiated between two governments to regulate international air traffic between the two nations. They specify arrangements for setting fares and capacity levels and cover technical details such as customs duties, funds transfers and airport charges. ASAs are only one of three areas generally covered by a bilateral agreement. The other areas are:

- *The Route Schedule:* Details of traffic rights and specifications of routes to be operated. Each country has the right to designate an airline(s) to operate its share of the traffic.
- *Memoranda of Understanding:* Contain annexes (sometimes confidential) which amplify or modify particular aspects of a basic ASA and typically detail capacity controls (ANZ McCaughan 1992).

Allocative efficiency Indicates the optimum allocation of scarce resources between end uses in order to produce a combination of goods and services which best meets the pattern of consumer demand.

Available seat kilometres (ASK) The number of passenger seats available multiplied by the number of kilometres flown. ASK may refer to a single aircraft on a single route or be aggregated as far as annual industry or operator totals.

Bureau of Air Safety Investigations (BASI) Has the prime responsibility for the investigation of all safety related occurrences affecting civil aviation in Australia. BASI plays an important role in the domestic aviation industry monitoring the operational standards and safety practices developed by the Civil Aviation Authority (CAA).

Cabotage The rights of a foreign airline to carry passengers within the borders of a state, formerly an exclusive right of that state's domestic airlines.

Civil Aviation Authority (CAA) A statutory authority set up under the *Civil Aviation Act 1988,* which commenced operations on 1 July 1988. It is a government business enterprise and is responsible for the provision of airways facilities and services, such as air traffic control, and the setting and implementation of safety standards.

Compass Mk1 The first 'new entrant' into the Australia domestic aviation market. Compass commenced operations on 1 December 1991 and ceased operations when it was put into liquidation on 20 December 1992.

Compass Mk2 Compass was 'relaunched' by Southern Cross Airlines (SCA) Holdings. The new Compass commenced operations on 31 August 1992 and it was put into receivership on 4 March 1993, ceasing operations on 12 March 1993.

Computer reservation system (CRS) These systems enable travel agents to keep track of the wide range of fares available on all routes as well as the connecting possibilities. Among other things, CRSs can be used to make direct bookings, plan business and holiday travel, and inquire on seat availability. Internationally, ownership of the various systems has become increasingly concentrated in recent years, through mergers and affiliations.

Consumer surplus The extra satisfaction (or **utility**) gained by consumers from paying a price for a good or service which is lower than that which they would have been prepared to pay.

Contestability theory Argues that the condition of entry into a market is the prime determinant of industry performance, rather than the number, size and distribution of firms in the industry or any other structural characteristic. A market is said to be **contestable** when new entrants face costs similar to those of established forms and when, on leaving the market, firms are able to recoup their capital costs, less depreciation (that is, there are no sunk costs). The mere threat of entry by new firms may be sufficient to ensure that established firms set prices which yield them only normal profits.

Cost function Algebraic expression representing the relationship between the prices and usage of various inputs and the overall cost of producing airline services.

Deregulation In the context of this report deregulation refers to the Australian Government's withdrawal from the detailed economic regulation of domestic aviation with respect to four matters:

- controls over the importation of aircraft were removed;
- the detailed determination of the amount of passenger capacity that may be provided by each domestic trunk airline and each regional airline using jet aircraft with more than 30 seats ceased;

- the Independent Air Fares Committee was abolished and the Commonwealth withdrew from the determination of domestic air fares; and
- constraints on the entry of new domestic operators to trunk routes were removed.

Domestic airlines Airlines operating scheduled domestic regular public transport services whose fleets include aircraft with more than 38 seats, or with a payload of more than 4200 kilograms, are designated by the Department of Transport and Communications as domestic airlines.

Econometric model A set of algebraic equations which attempts to represent the relationships among a group of economic variables; for example, between labour costs, maintenance costs and such like, and the overall costs of producing airline services.

Economic rent (rent) The amount by which earnings from the use of a factor of production (that is, land, labour or capital) exceeds the minimum sum necessary to maintain that factor in its current use or employment. Economic rent will be larger the less adaptable the factor, the shorter the relevant time period and the more fixed it is in supply.

Economies of scale Reductions in unit costs resulting from increasing all inputs by the same multiple.

Economies of scope Reductions in unit costs resulting from increases in the number of outputs produced; for example, the number of passenger categories, cities or submarkets served. (Because passengers demand trips for many purposes between many pairs of cities, an airline that serves both business and leisure markets in many city-pairs may be able to take advantage of efficiencies in the use of and provision of information and efficiencies in exploiting principal–agent effects that an equally scale-efficient airline serving fewer cities cannot.)

Economies of size Reductions in average total costs per unit of output resulting from increases in the gross size of an airline. Size may be reckoned by the number of planes or flights or some other characteristic. Economies of scale are a special case.

Economies of traffic density Variation in unit cost resulting from increasing the output of transportation services within a network of a given size (Caves, Lauritis & Tretheway 1984).

Efficiency Used in this publication as denoting **allocative efficiency.**

Elasticity See **price elasticity**

Externality Any indirect effect that the production or consumption of a good or service has on society. For example the noise pollution produced by planes around airports is a negative externality imposed on residents in these areas.

Factor inputs Used in this publication as: all the things necessary to produce airline services.

Federal Airports Corporation (FAC) A statutory authority set up under the *Federal Airports Corporation Act 1986,* which commenced operations on 1 January 1988. The FAC is a government business enterprise and is responsible for the provision of basic airport facilities, planning airport layouts and leasing facilities to airlines. The FAC owns and operates 23 Australian airports and its Act requires it to recover the cost of providing services to the aviation industry from its lands and facilities.

General aviation Incorporates all flying not conducted under the auspices of regular public transport or military operations.

Government business enterprise (GBE) Government-owned organisations which function as fully commercial or quasi-commercial enterprises selling goods and services and deriving a substantial portion of their revenue from those sales (Walsh 1986).

Great circle distance The shortest distance between any two points on the globe, measured over the earth's surface.

Hub Indicating the use of a hub and spoke network.

Hub and spoke network A network structure, resembling the hub and spokes of a bicycle, in which a single airport is the focus of an airline system, as opposed to a 'linear network' in which all airports are directly linked. In a hub and spoke network passengers are fed by spoke routes into the hub airport from which they take connecting flights to their destination. (For further information refer to Tretheway and Oum 1992.)

Interlining Occurs when a passenger requires two or more air carriers for a single trip. Carriers involved in an interlining agreement are required to honour tickets for transportation on their lines issued by other carriers involved in the agreement. Carriers must also accept and transport the baggage of passengers holding such tickets. The ticketing carrier collects the revenues from the passenger, and the carrier providing the service is paid when it presents the ticketing carrier with the customer's used ticket coupon (Tretheway & Oum 1992).

Last seat availability This term appears to have been used somewhat loosely in the industry; however, the BTCE understands that the term describes a feature of computer reservation systems which guarantees to travel agents the most complete access to an airline's inventory of seats. It

allows agents to withdraw seats from an airline's inventory and receive confirmation from that airline's internal reservation system.

Load factor Refers to the proportion of the available passenger seats which are actually occupied, and is expressed as a percentage.

Micro-economic reform Government regulatory reforms of individual industries and markets aimed at improving economic efficiency. Some of the measure used include:

- removal or liberalisation of entry-restricting regulations;
- liberalisation of guidelines under which regulations are administered;
- use of the price mechanism to allocate access to public infrastructure; and,
- tripartite (that is, government, employer and union) development of more efficient work arrangements.

Opportunity cost The cost of using scarce resources to produce a particular good or service, measured in terms of the alternatives thereby forgone.

Pareto optimality The maximisation of economic welfare of a community, so that it would be impossible to improve the welfare of one or more individuals without reducing the welfare of others.

Partial equilibrium analysis The analysis of relationships within a particular subsector of an economy, assuming that the events in that sector have such an insignificant impact on the rest of the economy that feedback effects will be negligible or non-existent. Each subsector in this analysis is treated as a self-contained entity.

Price elasticity A measure of the degree of responsiveness of demand to a given change in price.

Producer surplus The excess of actual earnings by a producer from a given quantity of output, over and above earnings the producer would be prepared accept in order to continue operating in the market.

Regional airlines Airlines operating scheduled domestic regular public transport services whose fleets include only aircraft with 38 seats or less, or with a payload of 4200 kilograms or less, are designated by the Department of Transport and Communications as regional airlines.

Rent *See* ***economic rent***

Regular public transport (RPT) An RPT operation is any airline or commuter operation which has a published schedule of regular services which are available to any member of the public.

Revenue passenger-kilometres (RPK) The number of paying passengers on board multiplied by the number of kilometres flown. RPK may refer to a single aircraft on a single route or be aggregated to yield figures of weekly or quarterly demand, or to yield fleet or industry totals. RPK divided by ASK will yield average load factor.

Revenue tonne-kilometres (RTK) Obtained by aggregating the product of the tonnes of freight, mail and passengers carried over each stage length and the stage length. A standard passenger weight (including baggage) of 90 kilograms is used.

Route density Physical output relative to network size, measured as revenue tonne-kilometres (RTK) per point served by an airline.

Schedule delay The length of time between when a traveller would ideally wish to depart from the airport and the departure time of the closest scheduled flight on which he/she can obtain a seat.

Stage length Distance between two airports, where only one take-off and one landing is involved. A flight consist of one or more stages.

Structure–conduct–performance paradigm A framework for analysis of industrial economics, identifying and specifying the causal chains linking aspects of market structure with elements of business conduct and industrial performance. Traditionally, the direction of causation has been presumed to run from market structure through conduct to performance. However, recent developments have highlighted the possibility of feedback effects.

Total factor productivity Total factor productivity is a measure of the amount of aggregate output produced by a unit of aggregate input, where appropriate weights are given to various inputs which may differ in quality.

Traffic-on-board by stage (TOBS) The aggregated (including transit) movement of revenue traffic from one airport to the next as a total and on a directional basis (that is, all movement between two directly connected airports regardless of the ticketed origin and destination of passengers).

Two airlines policy A series of economic regulatory arrangements, initially introduced in 1952 to prevent the emergence of a monopoly in the Australian domestic aviation industry. The two airlines policy officially came to an end on 30 October 1990 when the government withdrew from economic regulation of domestic aviation.

Utility A measure of the satisfaction or pleasure a person derives from the consumption of a good or service.

Yield management A technique used by airlines to maximise revenue from any one flight. The capacity of a flight is determined, and the demand by full

fare passengers for the flight is forecast, generally by using a historical database. The next step is choosing a probability rate for seating all potential full fare passengers and then reserving the appropriate number of seats to be sold only at full fare. A discount fare level is then determined for the remaining seats, and conditions are attached to their sale so that people willing to pay full fare are unlikely to be able to take advantage of the discount fares. Yield management enables airlines to sell at a discount those seats which have been predicted to go unfilled at full price.

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Abbreviations

AGPS	Australian Government Publishing Service
BTCE	Bureau of Transport and Communications Economics
CAA	Civil Aviation Authority
DTC	Department of Transport and Communications
FAC	Federal Airports Corporation
IAC	Industries Assistance Commission
IAFC	Independent Air Fares Committee
IASC	International Air Services Commission
NZ	New Zealand
OAA	Orient Airlines Association
PSA	Prices Surveillance Authority

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