COMMONWEALTH OF AUSTRALIA

Trade Practices Act 1974

IN THE AUSTRALIAN COMPETITION TRIBUNAL

FILE NO. 5 of 2003

RE: APPLICATION FOR REVIEW OF THE DETERMINATION OF THE AUSTRALIAN COMPETITION AND CONSUMER COMMISSION MADE ON 9 SEPTEMBER 2003 DECLINING AUTHORIZATION IN RELATION TO APPLICATIONS A30220, A30221, A30222, A90862 AND A90863 (QANTAS AND AIR NEW ZEALAND EQUITY AND ALLIANCE)

BY: QANTAS AIRWAYS LIMITED (ABN 16 009 661 901)
AND AIR NEW ZEALAND LIMITED (ABN 70 000 312 685)

Applicants

STATEMENT OF MICHAEL WILLIAM TRETHEWAY

1. My name is Michael William Tretheway. I have been retained by the Applicants, Qantas Airways Limited and Air New Zealand Limited, to prepare an expert report for the purposes of these proceedings.

2. The expert report prepared by me dated 14 April 2004 is attached to this Statement.

MICHAEW WILLIAM TRETHEWAY

APR 14 2004

DATE

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Prepared for counsel for submission to the Australian Competition Tribunal

14 April 2004
Report of Dr. Michael W. Tretheway

Non-Confidential Version

14 April 2004

prepared for counsel
for submission to the Australian Competition Tribunal
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1.0 Statement of Identity, Qualifications, and Interests

1.1 Statement of identity

1.1.1 I am Dr. Michael W. Tretheway. I reside at 12471 Alliance Drive, Richmond, British Columbia, Canada.

1.1.2 I am currently Senior Vice President Marketing and Chief Economist of InterVISTAS Consulting Inc.

1.1.3 InterVISTAS Consulting Inc. is an independent, employee owned consulting firm providing consulting services to various clients, largely in the transportation and tourism sectors. Our clients include airlines, airport operators, government (federal, state/provincial, and local), tourism authorities, hotel operators, rail carriers, urban transportation authorities, and chambers of commerce, among others.¹

1.2 My qualifications to comment in this matter

1.2.1 A copy of my curriculum vitae is provided at Appendix A.

1.2.2 I hold a Ph.D. in Economics from the University of Wisconsin.

1.2.3 From 1983 to 1996 I was an Associate Professor in the Faculty of Commerce and Business Administration, University of British Columbia. I have taught courses in air transportation management, managerial economics, business statistics, transportation economics, project evaluation, the role of transportation in the economy, government and business, and business logistics. I am the author of over 40 scholarly papers and my research has been published in journals such as The Rand Journal of Economics, The Review of Economics and Statistics, The Logistics and Transportation Review, Transportation, Transportation Research, The Journal of Transport Economics and Policy, The Journal of Air Transport Management, Annals of Aviation and Space Law, and the Transportation Practitioner’s Journal. I am the author of several books, including Airline Economics, Airline Cost and Performance, and Airline Deregulation and Privatisation.

¹ InterVISTAS Consulting Inc. had its genesis in the marketing and strategic planning department of the Vancouver International Airport Authority. In 1997, this group was formed into a wholly owned subsidiary of the airport authority, but has since added professionals from diverse areas of aviation, transportation, logistics and tourism and was sold to its employees in 1999. InterVISTAS Consulting Inc. pays a royalty to the Vancouver International Airport Authority for the use of the “VISTAS” name.
1.2.4 Since 1 January 1997 I have held a position as Adjunct Professor of Transportation and Logistics in the Faculty of Commerce and Business Administration at the University of British Columbia.

1.2.5 I have served on the Board of Editors of the *Logistics and Transportation Review*, the *Journal of Air Transport Management*, and the *Quarterly Journal of Business and Economics*.

1.2.6 In 1994, I served as a visiting fellow at the Australian Bureau of Transport and Communication Economics.

1.2.7 In addition to my duties at the University of British Columbia, I have taught at the Université Canadienne en France, Shanghai Jiao Tung University, Sian Jiao Tung University and Nankai University.

1.2.8 From January 1994 to March 1997, I was Special Advisor to the President, Vancouver International Airport Authority. In this role I worked in many areas of the airport authority and its subsidiary companies, which operate other airports in Canada and abroad.

1.2.9 From March 1997 to December 1998, I was Vice President of Marketing Services for YVR-VISTAS, a wholly owned subsidiary of the Vancouver International Airport Authority, which was later purchased by the employees of what is now InterVISTAS Consulting Inc.

1.2.10 Since January 1999, I have been Senior Vice President Marketing and Chief Economist of InterVISTAS Consulting Inc.

1.2.11 I have served as an advisor or consultant to government agencies: for example:

- the U.S. Civil Aeronautics Board;
- the Competition Bureau (Canada);
- the Canadian Transportation Agency;
- Transport Canada;
- the Minister of Transport (Canada); and
- The Canada Transportation Act Review Panel;

   to labour organisations:

- The Air Line Pilots Association;
• Canadian Air Line Pilots Association;
• Association of Professional Flight Attendants;
• Wardair Pilots Association;
• Council of Canadian Airline Employees;
• The Canadian Union of Public Employees; and
• The Canadian Auto Workers;

to a consumer group:
• The Consumers Association of Canada;

to the following airlines:
• Canadian Airlines International Ltd.;
• Pacific Western Airlines;
• Qantas;
• Air New Zealand;
• British Airways;
• American Airlines;
• Comair (South Africa);
• United Airlines;
• Scandinavian Airline System;
• Lufthansa;
• Cathay Pacific Airlines; and
• HMY Airways;

to the following aviation industry organisations:
• The International Air Transport Association;
• SITA Inc.;$^{2}$ and
• The Canadian Airports Council;

to airports, among which are:

• Auckland International Airport Corporation;
• Wellington International Airport Ltd;
• Comox Valley Airport Commission;
• Drewitz Airport (Germany);
• Gander International Airport Authority;
• Government of the Northwest Territories;
• Hamilton International Airport (TradePort International);
• Lamezia Terme International Airport (Italy);
• Moncton Airport Authority;
• North Peace Airport Society;
• Regina Airport Authority;
• Vancouver International Airport Authority;
• Winnipeg International Airport Authority; and
• Spokane International Airport;

And to the following tourism organisations:

• Council of Tourism Associations of British Columbia;
• Tourism British Columbia;

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$^{2}$ Société Internationale de Télécommunications Aéronautiques, which now does business simply as SITA.
• Tourism Nova Scotia;
• Tourism Saskatchewan;
• Puerto Rico Department of Tourism; and
• The Council of Ministers Responsible for Tourism (Canada);

and to others.

1.2.12 Among others, I have provided expert witness statements on behalf of:

• the (Canadian) Competition Bureau before the (Canadian) Competition Tribunal and the National Transportation Agency;
• Qantas and British Airways before the Australian Trade Practices Commission;
• Qantas before the New Zealand Commerce Commission;
• Qantas and Air New Zealand before the New Zealand Commerce Commission;
• Lufthansa, SAS and United before the Commission of the European Union;
• Comair before the South African Air Services Licensing Board;
• T1T2LP (Terminal 1 – Terminal 2 Limited Partnership) before the Federal Court of Canada;
• The International Air Transport Association before the Australian Competition and Consumer Commission;
• the Association of American Railroads before the Interstate Commerce Commission;
• Rocky Mountaineer Rail Tours Ltd. before the Canada Transportation Act Review Panel;
• the British Columbia Tourism Coalition for Improved Air Services before Canada Transportation Act Review Panel; and
• the Canadian Airports Council before the Canadian House of Commons Standing Committee on Finance.
• Hallcon Transportation Services before the British Columbia Motor Carrier Commission;
• Canadian National to the Competition Bureau (Canada); and
• AUT Technologies before the Federal Court in the United States.

1.2.13 I have provided expert witness statements in several labour arbitrations, including for:
  • The Canadian Auto Workers representing the pilots of Morningstar Airlines;
  • The Canadian Auto Workers representing airline customer service agents;
  • The Canadian Air Line Pilots Association, in several arbitrations;
  • The Air Line Pilots Association, in several arbitrations; and
  • The Canadian Union of Public Employees representing flight attendants.

1.2.14 My qualifications to comment on issues regarding airlines and/or airports have never been rejected.

1.3 Statement of interest

1.3.1 I am a shareholder in IVM Investments Inc. This company purchased YVR-VISTAS (subsequently renamed InterVISTAS Consulting Inc.). IVM Investments Inc. is the sole owner of InterVISTAS Consulting Inc.

1.3.2 I do not own any shares in any airline or airline service business, nor in any airport operating company, nor any other type of aviation service business other than IVM Investments Inc.

1.3.3 I have provided a statement in the applications to the New Zealand Commerce Commission for authorisation for Qantas to acquire 22.5% of the voting equity in Air New Zealand, and to implement a strategic alliance agreement between Air New Zealand and Qantas.
2.0 Questions to be addressed

2.1 Questions

I have been asked by counsel for the Applicants to address the following questions.

2.1.1 Explain the nature of the traditional full service airline (FSA) product.

2.1.2 Explain the low cost carrier (LCC) product.

2.1.3 What are the economic issues facing an FSA in respect of entry and expansion of an LCC?

2.1.4 To what extent are alliances or mergers occurring between FSAs in the world industry and why?

2.1.5 What does economic theory and the economic literature demonstrate about the competitive significance for the airline industry of the introduction or potential introduction of an LCC, with or without a second FSA?

2.1.6 What does the available data show on the effect of the introduction or potential introduction of an LCC, with or without a second FSA?

2.1.7 For markets in which an LCC operates or potentially operates, what is the relevance, in assessing the level of competition, of the number of airlines and market concentration?

2.1.8 In a market where there is an LCC operating on some but not all passenger routes, what is the competitive significance of the LCC’s presence in the market on routes on which it is not presently operating?

2.1.9 Explain the concept of network envelopment, with particular reference to the networks of Air New Zealand and Qantas.

2.1.10 What is the competitive significance of the 5th freedom carriers on the trans-Tasman, including Emirates and its expansion?

2.1.11 What is the current state of competition in the markets under consideration, including by reference to barriers to entry or expansion? In the present case, how do those markets sit against the analysis of economic theory and literature and experience in other countries?

2.1.12 Outline the development of entry and attempted entry by LCCs into the Australian domestic markets and the impact of that entry on existing FSAs (stating clearly your
understanding of the historical facts and the sources of that understanding) and then
express your view as to whether that development allows conclusions to be drawn as to
the competitive interaction between FSAs and LCCs and, if so, what those conclusions
are.

2.1.13 What are your views as to the likely counterfactual (or range of likely counterfactuals)?

2.1.14 The Applicants’ contentions in relation to the public benefits, associated with the Proposed
Arrangements are set out in paragraph 69 of the Applicants First Amended Statement of
Facts, Contentions and Issues. Outline your views (with supporting reasons) as to
whether the public benefits are plausible, supported by economic theory, and likely to arise
solely from the Proposed Arrangements.

2.1.15 Under the Alliance, what constraints will there be on the Alliance which will dictate against
raising prices or reducing output?

2.1.16 What is your opinion as to the weighting of the benefits and detriments of the Alliance?

2.1.17 What are the benefits or detriments of deferring any decision on the Alliance for, say, two
years?

2.1.18 What is your opinion as to whether Qantas and Air New Zealand can achieve the benefits
of the Alliance by restructuring their existing business operations (e.g., Tasman Express)
or through lower cost subsidiaries (e.g., JetStar and Freedom) without the Alliance?

2.2 Outline of Approach

2.2.1 I begin my statement by describing how the airline industry has emerged with two
significant business models, that of the full service airline and that of the low cost carrier,
also referred to by some as a value based airline (see Section 2.4 below). Section 3
provides a discussion of these two business models (some call them business formats)
and how they emerged, and then contrasts the two business models. Section 3 also
discusses the differing economics of the two business models with respect to costs,
consumer demand, pricing policies, and market extent.

2.2.2 To address questions 2.1.5 to 2.1.8, I start in Section 4 with a summary of the literature on
price effects in airline markets. There is a large and long literature on the issue of fare
‘premiums’ in the U.S. airline industry. This work began in the 1980s and was actively
continued into the early 1990s. It originally dealt largely with the issue of whether there
was a ‘hub dominance’ premium in air fares. Some of this work included market structure
variables. Generally, the early work found the existence of a fare premium at dominated
hubs, which led many, especially regulators, to the view that traditional measures of
market concentration were a good predictor of prices and an important market
performance dimension. However, it soon became clear that most of the early studies were not well designed to control for a number of important exogenous factors which influence airline prices.

2.2.3 The later literature recognised these deficiencies, and noting the serious limitations to the early work, continued to develop. Within the earlier literature specifications were often incorrect, e.g., the hub premium was picking up the effect of big cities (typically hub cities) which generate higher proportions of higher yield business travel. Thus a finding of a hub premium may simply be a reflection of the nature of high yield consumer demand at hubs relative to other points. Another important exogenous demand effect is that routes from hubs tend to be shorter, on average, than non-hub routes – hubs are typically located within a continent rather than on the periphery.³

2.2.4 The studies also began to observe a ‘Southwest Effect’, which suggested that in markets where Southwest, the original successful LCC, was present, the hub premium was smaller, disappeared, or was negative. This was not fully investigated at first, but as the literature progressed it turned out to be a more important determinant of prices (market performance) than the measures of market concentration.

2.2.5 The data used in the early studies largely predated the era when Southwest was present in a large number of markets and when other successful modern LCCs emerged. In the late 1990s and in the new decade there has been a new flurry of research in this field. Recent studies have identified the existence of a general LCC effect. As well, a few studies have commented on the effects of LCC entry in one market on prices charged by FSAs in other markets.

2.2.6 Continuing my investigation of the issues raised in questions 2.1.5 to 2.1.8, in Section 5 I conduct some new empirical analysis relating to the LCC effect versus the effect of additional FSAs in a market. The literature reviewed in Section 4 indicates that there is a large and statistically significant effect of the presence of an LCC in a market and that effect is much larger than the effect of any hub premium or other market concentration measure. While of considerable value, the existing research was not formulated so as to allow me to precisely answer the questions put to me by counsel. Accordingly, in Section 5, I use data similar to that used in the existing literature (i.e., the U.S. DB1A data),⁴ and I use models which are simple, but similar to those used repeatedly in the existing literature, but with some additional variables added to the regression to allow conditional inference. This allows me to more precisely address the questions put to me by counsel.

³ Note that the literature used data on average fares. In general, one expects fare levels to be higher on longer routes. Thus, route length (referred to in the industry as route stage length) is an important predictor of the level of fares on any given route.

⁴ U.S. Department of Transportation, Ticket Origin and Destination Survey.
2.2.7 The literature on the effect of market structure on airline prices is largely U.S. based. This is because the U.S. has the longest experience with deregulated airline markets, and because the U.S. is the only country with publicly available data to allow serious investigation of these issues. In Section 6, I complement the U.S. evidence with the experiences of Canada and Europe. Canada is a market where competition was ‘reduced’ from multiple FSAs and one LCC to one FSA and one LCC. In Europe I look at one of the two major LCCs, EasyJet, and investigate whether prices differ between its markets with one FSA versus multiple FSAs. Both of these investigations provide valuable insight into the questions at hand in Australia regarding whether a second FSA is needed in a market with an LCC in order to act as a competitive restraint on prices.

2.2.8 The data in Europe and Canada is more limited than that available in the U.S., and the approach I adopt in Section 6 might perhaps be thought of as a set of case studies, rather than a comprehensive statistical study. Nevertheless, looking at the Canadian and European experiences allows one to test whether the more advanced statistical analysis using U.S. data and experience is robust and able to be generalised to other markets. While acknowledging differences between the U.S. and Australian experience, my examination of other overseas markets (i.e., Canada and Europe) offers support for the general applicability of the U.S. experience and evidence in this matter.

2.2.9 In Section 7 I examine data on Australian markets. I begin by reviewing some previous work on the effect of market structure on prices on domestic Australian routes conducted by Winston and Morrison in their submission to the New Zealand Commerce Commission on the proposed Alliance. As well, I examine the confidential data provided in statements of the lay witnesses for the Applicants with regard to pricing developments as Australia’s airline markets were restructured. While this data is not as extensive as that in the U.S. and is constructed somewhat differently, it does provide insight into what has happened in Australian markets over the past few years as the domestic airline industry underwent dramatic restructuring.

2.2.10 Section 8 turns from empirical investigation to economic theory. It discusses mergers and alliances in the airline industry and looks at the issue of economies of scale in the industry and the economic forces for consolidation of the FSAs. I describe how consolidation is necessary, but how government policy regarding foreign ownership of air carriers is an impediment to mergers. In order to achieve many of the benefits of mergers, air carriers have developed a number of different types of alliance agreements. While falling short of the full marketing and cost efficiency benefits of outright merger, these alliances have provided significant benefits for carriers and consumers. As well, the importance of alliances for consumers in satisfying their demands for air travel services is discussed. I also briefly examine the recently approved KLM-Air France transaction. This involves both an alliance and an equity investment and may be of some relevance to the current situation in Australia and New Zealand.
2.2.11 Section 9 looks at the use of subsidiary and associated carriers by FSAs. Use of such carriers for either marketing or cost reduction objectives began almost immediately after deregulation in the U.S., especially by the holding company of what today is Continental Airlines. Another wave of such brands and subsidiaries emerged in the 1990s, and again in the past few years, as FSAs have been compelled to dramatically restructure their operations. This section looks at the types of carriers and their success records. This section uses case studies from the European Union, Canada, the U.S., and New Zealand. It also describes recent developments in Australia.

2.2.12 Section 10 examines the issues of network envelopment and the role of 5th freedom carriers.

2.2.13 Section 11 then discusses entry conditions into airline markets. It begins with a general discussion and then turns to the specifics of the Australian markets. In this section I separately discuss entry conditions into domestic services, trans-Tasman services, and long haul international services, as each has a somewhat different regulatory regime, and the operating characteristics and key consumer demand parameters differ.

2.2.14 Section 12 describes the current state of competition in those Australian markets which could be affected by the proposed alliance and investment. Here, I also discuss the issue of counterfactual scenarios, and competitive constraints on the Alliance for the factual scenario.

2.2.15 In Section 13, I review the issue of public benefits and offer my opinion on the plausibility of the claimed benefits.

2.2.16 Finally, in Section 14, I review the questions that have been put to me by counsel and offer my opinions.

2.3 Evidence Reviewed

2.3.1 In forming my opinion, I utilised documents provided to me by counsel for the Applicants; documents I obtained on my own initiative, such as academic papers, annual reports of air carriers, etc., and data I obtained.

2.3.2 Appendix B provides a list of documents provided to me by counsel.

2.3.3 Appendix C provides the bibliography of the literature I review in Section 4, as well as other academic or industry publications I cite.

2.3.4 Appendix D provides a list of documents I obtained on my own initiative.

2.3.5 Sources of data used in empirical analysis are provided in relevant sections of my
2.4 Terminology

2.4.1 In this statement I have adopted the Applicant’s terminology to describe full service network air carriers as FSAs, or Full Service Airlines.

2.4.2 However, while it is common in Australia and New Zealand to refer to air carriers such as Virgin Blue as Value Based Airlines (VBAs), I prefer to use the term Low Cost Carrier (LCC) and do so throughout my statement. Where appropriate, I interchange LCC and VBA, especially when referring to the submissions of others.

2.4.3 My reason for preferring the LCC terminology, is that, in my view, FSAs are distinguished from LCCs in large part due to the higher value products they provide to consumers. Higher value in this sense means that the FSA product has additional features (such as seamless access to the global network, higher in-flight amenities, etc.), which a number of consumers seek.5

2.4.4 Providing these additional features requires the FSA to incur higher costs. While these costs might be reduced through efficiencies and new labour-management agreements, the costs of network and other value added services are inherently part of the FSA’s cost structure and cannot be shed without also shedding network connectivity and the other value added features of FSA services.

2.4.5 In contrast, the LCCs offer consumers a simpler product. One of the key distinguishing characteristics of LCCs is their lower costs of production, hence my preference for the LCC terminology.

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5 I further discuss these value adding features of the FSA and the different product characteristics of FSAs and LCCs in Section 3.2. There, and in Section 3.3, I note that while the FSA product has additional service dimensions, the LCCs constrain the prices of FSA products, even their premium products. It is my opinion that the so called disappearance of the business traveller from the market is, in large part, a manifestation of the impact of the one way, very low fare offerings of LCCs.
3.0 The Emerging Airline Industry Structure: Full Service Airlines (FSAs) and Low Cost Carriers (LCCs)

3.1 The Full Service Airline Business Model

3.1.1 I refer to the full service airline business model as that pursued by carriers such as Qantas, Air New Zealand, Cathay Pacific, Singapore Airlines, Lufthansa, British Airways, United Airlines, American Airlines, etc. There are many differences between the business strategies pursued by these carriers, but there are a few key aspects of their business models which they generally share in common.

3.1.2 **Global Network Connectivity.** First, these carriers share the strategy of attempting to offer their customers great connectivity to a global airline system. Since 1945, when the International Air Transport Association (IATA) was formed, these carriers have invested in procedures and systems that allow one carrier (or an agent of the carrier) to sell a product which can take a passenger from origin to ultimate destination, even if it requires one or more transfers to other airlines. This high connectivity product is extremely valuable to a large number of travellers. IATA, individual airlines, support organisations (such as SITA which facilitates airline communications) and governments have built an excellent and relatively seamless network of services. The IATA (and other) interline systems allow an airline (or an agent) in one part of the world to price and sell an airline ticket in another part of the world to a passenger with a long and/or complex itinerary. I refer to this first characteristic of FSAs as *network connectivity*.

3.1.3 Today a number of airlines have entered into alliance agreements to allow them to provide an even higher level of connectivity. While the IATA system allows any participating carrier to connect to another, the alliances go further by co-ordinating schedules, more tightly integrating pricing so as to allow lower fares for complex itineraries of three or more flight segments, and co-ordinating certain value added services such as lounge access on a global scale.

3.1.4 **Network connectivity is inherently costly.** Providing network connectivity is inherently an expensive proposition. Carriers must invest in computer and other systems to enable rapid and seamless carrier-to-carrier communications. An FSA needs a staff that understand the nuances of the interline system and must participate in global forums dealing with issues such as the acceptability of a ticket issued by another carrier and standards on luggage that can be checked-in. Much staff time (hence, a larger staff) is required to deal with irregularities that arise day to day and thereby facilitate the journeys of individual passengers, whether it is baggage which has gone astray somewhere on the
passenger’s itinerary, or rules for transporting cherished pets. Network connectivity also requires co-ordinated timing of a large number of flights, so as to minimise connection times and maximise the number of cities that can be connected in any given bank of flights. Achieving this high level of connections is inherently costly. Aircraft may need to sit idle at an airport for a period of time in order to depart within a co-ordinated bank of flights. This reduces aircraft utilisation. More gates and labour will be required in order to accommodate the maximum number of connections in a given connection bank of flights.

3.1.5 **High Legacy Costs.** The first general characteristic of FSAs is the network connectivity they provide and the inherently costly nature of providing this service. A second general characteristic of FSAs is that, in addition to the costs of network connectivity, they have relatively high costs of labour and other inputs needed to provide services. High cost is relative to newly created carriers which are focussed on costs and are able to enter the industry with de novo labour compensation programs, productivity agreements, supplier relationships, and consumer expectations. Some refer to these high factor costs as legacy costs. Generally, they are related to 75 years of collective bargaining and/or to traditionally high service levels offered to passengers.

3.1.6 Consider first the FSAs’ high factor costs. FSAs agreed to pay high wages to employees over a span of years. A good example of how this came about was when higher speed aircraft were introduced. In the early days of aviation, for example, it may have required 12 hours of flying time to travel across a continent such as North America or Australia. When faster aircraft were introduced into the fleet, fewer pilot (and other labour) hours were required for the same journey. Generally this reduced flight costs while the airline could charge the same (or higher) air fares for the faster service. Pilots and others bargained for sharing these productivity gains via higher wages, additional benefits or restrictive work rules. Over the decades this resulted in superior wages relative to many other sectors requiring similar skills and thus higher costs for the air carriers. Today, a newly created air carrier will often find it can hire skilled pilots and other labour for a lower wage and benefit package than the legacy (i.e., FSA) carriers, as they have not had to bargain for sharing historical productivity gains.

3.1.7 **Costs of Value Added Services.** Collective bargaining and network connectivity costs are not the only reason why FSAs have relatively high costs. Among many others is the costs of offering a high level of service. For various reasons, FSAs historically offered all passengers a number of value added services, such as in-flight meals, even on short haul flights, free non-alcoholic beverages, lounges for frequent travellers, etc.6 These services

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6 These amenities can also be traced to the early days of air travel. When transcontinental trips required 12 or more hours, passengers needed services such as meal services, lounges during stopovers, and amenity packages for in-flight use. As aircraft became faster, it was difficult to shed these costs, as passenger expectations had become fixed. As well, because governments regulated air fares, amenities become an important means of product differentiation between FSAs.
individually added to an FSA’s costs, and collectively the cost burden cumulated to a sizeable amount.

3.1.8 **Service Quality: High Frequency, Last Minute Seat Access.** Another dimension of FSAs is that they provided a high level of service quality. While this includes various on the ground and in-flight services, most importantly it includes high service levels in terms of frequency of service and capacity sufficient to provide a high level of last minute availability of seats.

3.1.9 In part, governments were responsible for the high service quality offered by the legacy FSAs. To begin with, in the past most non-U.S. FSAs were government owned and directed. In Australia, the government effectively regulated, if not determined, the frequency level, schedule and type of aircraft operated.\(^7\)

3.1.10 FSAs generally offer a level of capacity, and manage access to that capacity, so as to provide a high level of last minute access to seats for those travellers with unpredictable travel needs. Providing this higher level of capacity and managing access to it requires multi-hundred million dollar investments by the FSAs.

3.1.11 **FSAs: High service value, but costly to provide.** It is my opinion that FSAs offer a product with a high level of service, or a high value. High value in this sense means that the FSA product has additional features (such as high network connectivity and last minute seat availability, etc.) which a number of consumers (but not necessarily all consumers) seek and for which they are willing to pay. Value means *value to the consumer* in this context.

3.1.12 While there are many elements to the high level of service offered by FSAs, three dimensions are of paramount importance: i) network extent and connectivity, ii) in-flight and on the ground service levels, and iii) high probability of last minute seat availability.

3.1.13 The FSAs operate medium to large networks, with great connectivity to the global air transport system. That connectivity is achieved via alliances and the IATA interline system. FSAs typically provide redundancy within the service network. This provides the ability to route passengers via alternate gateways and flights if there is a service disruption.\(^8\) To many passengers, especially some types of business travellers, the higher reliability this provides is of great value.

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\(^7\) This was accomplished, in part, via aircraft import regulations.

\(^8\) For example, if a passenger has booked a Brisbane-Perth flight, and if the aircraft is unavailable for mechanical or another reason, the FSA can carry the passenger to the Perth destination via Sydney or Melbourne. Because of high frequency service and well integrated flight schedules, the existence of such alternative routings on the FSA is of value to a number of travellers. These include not only business travellers, but also those attending important family events (weddings, funerals), etc.
3.1.14 The high connectivity network, the high quality of service, and the high seat availability which is made available by FSAs provides value to some consumers but is inherently costly to provide. Network connectivity requires major investments in information systems to track complex itineraries and to communicate with information systems of other network airlines. Investment must be made in infrastructure systems to support the network (such as more advanced baggage systems and catering delivery and information systems). Provision of high in-flight and on-the-ground service levels increases unit costs. High last minute seat availability requires expensive information systems to manage seat availability and may require operating with a larger number of empty seats, on average, than an LCC on the same route.

3.1.15 It should be noted that there is a substantial number of travellers for whom the extensive network and high service levels are not needed. Nevertheless, these passengers are still processed by FSAs through these costly systems.

3.2 Emergence of LCCs/VBAs

3.2.1 While there have been many attempts over the past twenty-five years to establish financially viable LCCs, it has only been in the last seven years that a widely replicable business model for such operations has been achieved. Of the early attempts at low cost operation, that of Southwest Airlines in the U.S., now 33 years old, emerged as one of the few successful models. It has only been in roughly the last decade that other investors and managers have successfully adopted and implemented this business model to a large number of other markets. Today, air carriers following variants of the Southwest model have appeared in Europe (e.g., Ryanair, EasyJet), Canada (e.g., WestJet), South America (e.g., Brazil's GOL), Australia and New Zealand (e.g., Virgin Blue and Pacific Blue), and Asia (e.g., Malaysia’s Air Asia), among others.9

3.2.2 There were many previous attempts at LCC business models, but these were not successful for a variety of reasons, including government barriers to entry which constrained markets which could be served, airport and other infrastructure capacity constraints, and failure to understand or fully implement key aspects of the business model.10

3.2.3 Key enablers of the emergence of viable LCCs have been a) deregulation of markets (including in Australia and between Australia and New Zealand, e.g., the 1996 SAM); b) in some jurisdictions, the availability of airport capacity, in part but not exclusively from the

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9 See Appendix E for a graphical depiction of the spread of LCCs. The appendix does not show all LCCs, only a selection to indicate the wide geographic implementation of the business model.

10 A few ‘new entrant’ airlines were absorbed into FSAs. People Express is an example. It was eventually absorbed into Continental Airlines.
use of uncongested secondary airports in major markets, a successful means of solving barriers to entry from airport congestion as well as offering lower costs;\textsuperscript{11} and especially c) better understanding of all the elements of the LCC business model, especially proper capitalisation of the air carrier.

3.2.4 Regarding the first, Thomas Lawton recently stated, "The global economic liberalisation process of the late 1990s was linked inextricably with the emergence of LFAs [low fare airlines] in many countries."\textsuperscript{12}

3.2.5 The demonstrated success of a few new LCCs, such as Ryanair and WestJet, to replicate the essential elements of Southwest Airlines business model has induced capital markets, broadly defined, to finance an increasing number of LCCs.\textsuperscript{13}

3.2.6 These carriers have been demonstrating sustained growth, with steadily increasing fleet sizes, number of passengers served, revenues, and in many cases profits. For example, it is typical to commence operations with three or so aircraft, and then steadily add capacity. In the early years an LCC may experience growth rates as high as 100%. Growth then typically attenuates to 30-60% at the two to eight year point. Steady additions to capacity on an ever increasing base lowers the growth rate, although it remains substantial. Canada’s WestJet, now in its seventh year, is still growing in the 30-40% range. The LCC with the longest track record is 32 year old Southwest Airlines (U.S.). It grew at an average annual growth rate of 14.7% from 1991 to 2001. This is significantly in excess of the 3.2% growth of the U.S. major network carriers. Appendix F shows growth rates of Southwest and Ryanair relative to the aggregates of their respective key FSA competitors.

3.2.7 Investigating a selection of ten of the major LCCs (see Appendix G) reveals that they have 667 aircraft on order and 808 on option, as of March 2004 and as reported by BACK Aviation Solutions. This demonstrates the huge expansion potential of these carriers. In contrast, many of the network carriers with whom they compete have few aircraft on order at the present time. Of those FSAs that do have aircraft on order, a number have deferred delivery until much later in the decade. Continental Airlines, for example, recently (July 2003) deferred delivery of almost all of the 737s it has on order until 2008 or later. One

\textsuperscript{11} It is interesting to note that in Canada, LCC WestJet originally started at Hamilton (YHM), the secondary airport in the greater Toronto region. With the decline in traffic due to 9/11, Air Canada’s bankruptcy and SARS, as well as some increase in runway capacity at Toronto Lester Pearson International Airport (YYZ), WestJet has transferred some of its Hamilton capacity to YYZ. Some speculate that this is because WestJet believes airport slots will become scare once again, as Air Canada emerges from bankruptcy, and has decided to lock-up grandfather rights to YYZ slots at desirable times.


\textsuperscript{13} Some LCCs are financed by broad shareholdings (e.g., WestJet, Ryanair), some via private investment, such as the original financing of Virgin Blue, and some via an IPO (Virgin Blue again, WestJet).
must also consider that a substantial portion of the aircraft that FSAs have on order are intended as replacements rather than growth. Among the U.S. LCCs, most of the fleet on order and option is intended as growth.\textsuperscript{14}

3.2.8 As time passes, the high growth rates of LCCs are resulting in an ever increasing share of traffic. In the U.S., where the LCC business model has been pursued successfully by Southwest for over 30 years, it and other LCCs currently provide 24\% of U.S. domestic passenger seat capacity. With their traffic growing at double digit rates, their share of passengers carried will continue to increase.\textsuperscript{15}

3.2.9 In a paper published in the \textit{Journal of Air Transport Management}, I expressed the view that the LCCs will eventually provide 50\% or slightly more of the seat capacity in continental markets:\textsuperscript{16}

The existing market share of the LCCs in the U.S., the growth of these carriers as manifested in their fleet plans and the redeployment of some of the capacity of the FSNCs [FSAs] to quasi LCC operations suggests that eventually the LCC business model will serve at least 50\% of the domestic market. It is not unrealistic to anticipate that the FSNC business model would serve only half of the market or possibly a bit less than this. The above suggests that the FSNCs will be reduced to somewhere in the range of 40-50\% of the domestic U.S. market.\textsuperscript{17}

3.2.10 Large LCC traffic shares will also be achieved in Europe, Canada and Australia/New Zealand. Consider Canada. Air Canada has a fleet of roughly 250 jet aircraft. Its post restructuring fleet plan, as reported by the \textit{Globe and Mail}, shows its total fleet declining and then recovering only toward existing levels by 2008. WestJet has a current fleet of roughly 40 aircraft and has orders and options to grow its fleet to just under 90 aircraft by 2008. Excluding Air Canada’s long haul wide body fleet (which is largely used for intercontinental service) from the consideration, this suggests that WestJet alone could achieve a 2008 traffic share in the market greater than 35\%, even without considering the

\textsuperscript{14} Southwest is retiring its 737-200 fleet. In 2004, the carrier is taking delivery of 47 737-700s, with 17 of these replacing retiring 737-200s (of much smaller capacity), for a net fleet growth of 30 aircraft. The carrier has no plans to retire its 737-300/500s, and expects that most of its aircraft on order will be incremental fleet capacity. Source: phone conversation with Schedule Planning Department of Southwest Airlines.

\textsuperscript{15} The 24\% share was computed using OAG data for 2003, full year.


\textsuperscript{17} If one uses the 3.2\% average annual growth rate of passengers carried by U.S. ATA network air carriers (excluding Southwest) and the 15\% annual rate of growth of the LCCs (including Southwest), then in five years, the LCCs will grow from a passenger carried share of 24\% to 38\% and to 51\% after ten years. This does not include any capacity shifted by FSAs to quasi LCC formats. The large number of incremental aircraft on order and option by the LCCs and the low number of aircraft (largely for replacement) on order by the U.S. FSAs, suggests that these simple calculations may be a reasonable indicator of future shares of passengers carried.
other LCCs in the market. In Europe, I note that Ryanair and EasyJet combined have 247 aircraft on order and 245 aircraft on option, again supporting a conclusion that their traffic share will grow. In Australia, Virgin Blue indicated in its prospectus that it would end 2004 with 44 aircraft (737-700s and 737-800s). It also indicated it had purchase rights from Boeing to acquire up to 50 additional aircraft. While expansion of fleet capacity does not necessarily translate into a higher market share, the record of the large, successful LCCs is that their traffic growth is roughly proportional to the growth in their fleet capacity.

3.2.11 It should be noted that these carriers have demonstrated the ability to attract equity and debt capital to finance their expansions. The market capitalisation of Southwest’s equity, for example, exceeds that of all U.S. FSAs combined, and did so even prior to the tragic events of September 11, 2001. In Europe, LCC Ryanair often trades places with Lufthansa and British Airways in having the highest market capitalisation of any European air carrier; and in Canada, even prior to September 11, 2001, WestJet had a market capitalisation which exceeded Air Canada’s by a factor greater than three. Virgin Blue claimed that its share offering was ten times oversubscribed, and that the market capitalisation of the company was A$2.3 billion.

3.2.12 The LCC success has not been confined to leisure or other “discretionary travellers.” The LCCs have made major penetrations into the “business” traveller segment. This has been acknowledged by Virgin Blue in various public statements. The Business Travel Coalition (U.S.) recently indicated that LCCs are stimulating business travel and act as a discipline on major airlines’ pricing:

“Much of the 4% growth in business travel that BTC projects for 2004 will likely be attributable to low-fare carriers’ stimulation of demand as they enter an ever expanding number of markets and discipline major airlines’ pricing.”

3.2.13 Finally, it is worth commenting on the large margins LCCs have been able to achieve. Appendix J provides graphs of break-even and actual load factors for selected LCCs. A number of observations can be made. While FSAs historically operate on average with only a 3% average margin between actual and break-even load factors, LCCs typically operate with much larger gaps often in excess of 10% and as high as 20%. Since September 11, 2001, while almost all U.S. FSAs have not been able to achieve actual load factors which exceed break-even load factors (in some cases, there are negative gaps of

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18 A Virgin Blue ASX announcement (23 March 2004) indicated that it’s fleet plan is under continuous review. It has indicated that it will take delivery of an additional 8 aircraft in the year ending 31 March 2005, although 2-3 aircraft may be returned lessors.
19 See Appendix H for the recent market capitalisations of selected airlines.
21 “Analysis: restructure more fully, or die: the days of high business airfares are gone forever,” Business Travel Coalition, 19 March 2004. Obtained from BTC web site (www.btcweb.biz). Emphasis added.
10% or more), the U.S. LCCs have maintained positive margins.

3.2.14 It is thus my opinion that LCCs have developed into financially successful carriers, serving an increasing share of the traffic in domestic and transboundary markets, and that they will achieve continuing success. Unlike many of the network air carriers, they have an ability to attract significant additional equity capital to finance dramatic expansion. Virgin Blue in Australia is part of this industry development.

3.3 Why LCCs have a constraining effect on FSA prices

3.3.1 I was asked to address the issue of what are the economic issues facing an FSA in respect of entry and expansion of an LCC. To do this, I examine the pricing practices of FSAs versus LCCs and what economic theory indicates regarding LCC pricing practices acting as a constraint on FSAs.

3.3.2 Lower Prices.
The LCCs have had two major impacts on the FSAs. Both of these have undermined the ability of FSAs to earn revenues to cover their high network, legacy and services costs. First, LCCs have introduced significantly lower prices in the market. This is based on their lower costs – lower because they do not offer the inherently costly degree of network connectivity the FSAs offer, they do not offer the same degree of service amenities, and they do not have legacy factor costs.

3.3.3 LCC prices are typically less than the lowest prices regularly charged by FSAs prior to LCC entry.

3.3.4 Because many of an FSA’s former passengers do not need network connectivity for all their journeys or do not need service amenities, these travellers are willing to substitute the LCC product for an FSA trip.

3.3.5 As an LCC offers lower prices, if the FSAs lower their prices in response, even if only for a

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22 Data on actual and break-even load factors for US FSAs was provided in the 27 February 2004 issue of Aviation Daily, p.7. For the 12 months ending 3rd quarter 2003, the U.S. FSAs had an actual load factor average of 74.1%, versus a break-even requirement of 81.6%. Each of the six FSAs operated during this period below break-even. Most noticeable has been United, with an actual load factor of 75.1% versus a break-even load factor of 88.6%. Even carriers that avoided seeking bankruptcy protection have been operating below break even. American, for example, achieved an actual load factor of 72.4% versus break-even of 80.3%.

23 I define transboundary markets as those which cross national frontiers on short to medium haul distances. The internal market of the European Union (plus Switzerland) are transboundary markets. I make this point, as while U.S. LCCs have largely confined themselves to domestic markets to date, carriers following the LCC business model have crossed national frontiers. WestJet in Canada has recently announced scheduled services to U.S. destinations, and U.S. LCC JetBlue has applied for an international route license to serve Canada (it already announced service to the Dominican Republic, commencing June 10, 2004).
portion of their seats, their average revenue per passenger (yield) declines.

3.3.6 **Undermining traditional FSA price discrimination.**
Second, the LCCs have introduced different pricing schemes which have further undermined the revenue base of FSAs.

3.3.7 When an industry has low marginal costs and either high fixed costs or joint costs, then a means has to be found to offer marginal cost based fares in the market while generating sufficient revenues to cover costs. Price discrimination is used in many industries to achieve this and is regarded in transport industries as an efficient way to recover costs.

3.3.8 Both FSAs and LCCs engage in price discrimination, in the sense that travellers purchasing tickets at different points in time before a flight, or with different restrictions on the use of the ticket, pay different prices.

3.3.9 After considerable market research, FSAs almost uniformly adopted a price discrimination scheme which utilised restrictions on the trip to effect the ability to charge different travellers different prices. To “fence off” the high willingness to pay travellers from those willing to travel only at low prices, the FSA price discrimination trip restrictions typically consisted of a required return trip, required Saturday stayover, and/or minimum and maximum stay requirements.24

3.3.10 However, any price discrimination scheme is vulnerable to loss of those consumers paying the highest prices either to a competitor with a uniform (non-discriminatory) pricing scheme or to a competitor with a different price discrimination scheme.25 Because almost all FSAs used the same price discrimination methods, the traditional price discrimination structure allowed the FSA airline industry to support its high cost base for many years.

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24 The requirement to purchase a return ticket in order to avail one of a discount air fare is often not directly articulated, but rather implicit in the ‘Saturday Stayover’ or other minimum trip restrictions.

25 There is a debate as to whether air carriers price discriminate or offer differentiated products to different consumers. For example, the ability to purchase a seat at the last minute might be viewed as a differentiated product from purchasing seats in advance. The consumer differentiates these products and the costs to an air carrier of the two products can be quite different, with the product offering last minute seat availability requiring provision and/or management of extra capacity. (Even if capacity is managed to ensure seat availability at the last minute, rather than providing excess capacity, there is a higher cost to the carrier. Seats sold well in advance of a flight have certain revenues, while seats held for last minute sales have risk associated with their revenues. There is a cost in the sense of foregoing certain revenues from advanced seat sale in order to have last minute availability.)

It is my view that carriers do a combination of selling differentiated products and price discrimination. The proof that there is price discrimination is simple: when restrictions are removed, we observe many passengers that previously purchased high fare (and possibly higher quality) airline services availed themselves of the lower price services. If they valued the extra quality of the unrestricted but high fare tickets they previously purchased, they would continue to pay for them. The fact that the mere removal of restrictions results in substantial changes in passenger purchase decisions indicates that price discrimination was present which forced passengers to purchase higher fare services.
3.3.11 LCCs also use price discrimination schemes. However, the scheme they have adopted is based largely on the date of purchase of the ticket\(^{26}\) and not on the restrictions on the trip.

3.3.12 This is a simpler price discrimination scheme and does not generate as much revenue as the FSA scheme did. However, the lower revenue is not a problem for LCCs as their costs are lower as well. But because the FSAs’ customer base finds the LCC product to be an acceptable substitute, the FSAs have lost an important part of their revenue base. The FSAs could, and in fact some have responded with similar pricing structures\(^{27}\), but this may generate less revenue to cover their higher costs.

3.3.13 It is the removal of restrictions on the trip which has fundamentally undermined the ability of FSAs to engage in the degree of price discrimination they had in the past. Most importantly, LCCs have removed the need to purchase a return ticket in order to qualify for a low price, and thereby removed the Saturday stayover and minimum/maximum stay requirements. The offering of low priced one way tickets by LCCs is a hallmark of their business model. Southwest, Ryanair, EasyJet, WestJet, JetBlue, Virgin Blue and almost all others offer low one way fares and have done so from their inception.

3.3.14 The LCC price discrimination practice has seriously and irrevocably undermined the ability of FSAs to command premium prices from those passengers with the highest willingness to pay. In many cases the gap between the previous price charged by an FSA to these passengers and the LCC price is very large. The business traveller unwilling or unable to book a return flight, stay over a Saturday, and book well in advance, previously had no choice but to purchase a high fare, but flexible FSA ticket. Because this traveller has a high willingness to pay, the FSA price discrimination scheme extracted some of their ability to pay, to the FSA’s benefit. When an LCC enters the market, this passenger finds that an acceptable air service is available at a significantly lower price from the LCC without the return and Saturday stayover requirement. There may still be a premium charged by the LCC for booking close to the day of the flight, but typically this premium is small relative to the previous FSA price for “last minute” seat availability.

3.3.15 For example, an examination of Virgin Blue fare offerings on their web site on 17 March 2004 for the Brisbane – Adelaide route revealed six fare classes from A$139 to A$260, plus one fully flexible and refundable fare class of $329. The $139 fare was available for bookings on that date for travel two months hence, while next day travel was only available

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\(^{26}\) They may also charge higher prices for flights at peak periods.

\(^{27}\) The 8 March 2003 statement of Paul Richard Edwards describes Qantas’ pricing response as a consequence of the entry of LCCs into Australia (beginning at paragraph 110). The statement of John Fondren Harrison describes Air New Zealand’s new pricing policy on trans-Tasman routes (beginning at paragraph 44). The statement of Michael Anthony Swiatek comments (at paragraph 194) on the need for a new fare structure to meet the challenge of LCCs. Harrison describes (at paragraph 114) how Tasman Express was a response to the entry of four 5th freedom carriers and the planned entry of Virgin Blue.
at the A$260 level. While this pattern is typical, it is not a rigid rule. On 20 March 2004 (a Saturday) a ticket for next day travel was only A$165, while the two month advanced purchase fare was A$155. On the 20th, 3 day advance purchase tickets (for travel on Tuesday) were A$215, likely reflecting higher demand for weekday travel.

3.3.16 The result is a loss of premium traffic from the FSAs as the business traveller increasingly books on LCCs.

3.3.17 This, in turn, seriously undermines the revenue base of FSAs. This revenue erosion may ultimately threaten the existence of some FSAs if they are not able to shed costs sufficiently. The dilemma is that being an FSA is inherently more costly due to the costs of network connectivity, last minute seat availability, and other services provided.

3.3.18 This impact is not confined to discretionary travellers, such as tourists or those visiting friends and relatives. The unrestricted low fares offered by LCCs will also influence business travellers, including those who previously flew in the business cabin. For example, in Canada, before WestJet, business travellers generally chose between an unrestricted economy fare (Y, $1700) and a business class fare (J, $1950) on a route such as Vancouver-Ottawa. At this difference in fares, many business travellers found the premium for business cabin travel acceptable and often purchased J, due to its higher productivity or comfort. Even when there was an advance purchase non-refundable but otherwise flexible fare available, such as M ($1200 one way but which allowed changes to date or flight), the difference may have been acceptable to justify business cabin service.28

3.3.19 However, when an LCC enters the market and offers a walk up (no advance purchase) but non-refundable one way fare of $375 on the route, the huge difference in fares makes it difficult for many business travellers to justify purchasing J, or even a flexible Y fare. Prior to the entry of the LCC with very low walk up fares, a business traveller could justify the higher cost of a J fare by the higher productivity of travelling in the business cabin. Consider a consultant who is able to undertake billable work while travelling in the business class cabin, but cannot do so due to the space limitation in the economy cabin.29 On a 4.5 hour flight, the revenues from a billing rate of only $60 per hour can justify the cost difference between Y and J, and a rate of $170 per hour or higher can justify the M to J difference. But with the LCC fare of $375, a billing rate above $350 per hour ($2800 per day) is required to justify the J fare for the business class service. Put differently, at a fare of $375, the $350 per hour consultant can justify travelling on the LCC and reading a novel as being more cost effective for the client than paying the J class fare and billing a client for work done on the flight.

28 The statement of John Fondren Harrison describes the drop in fares with their Tasman Express initiative (beginning at paragraph 45).

29 E.g., many economy cabins have a seat pitch which makes it impossible to open today’s typical large screen personal computers.
3.3.20 Impacts on FSAs.
The entry of an LCC into a market has two impacts on FSAs.

- First, there is a direct diversion of some of the FSA’s previous customers to the LCC.
- Second, the inability to sustain the previous FSA price discrimination scheme leads to the introduction of a new pricing scheme more similar to that of the LCCs.

3.3.21 The inability of an FSA to continue to charge high prices to high willingness to pay passengers reduces profits -- unless it can achieve cost reductions sufficient to offset the decline in its yields. In much of the world, the FSAs have clearly revealed that often they cannot reduce costs sufficiently, at least in a short time period, to the level of the LCCs. Especially vulnerable when faced with entry of an LCC have been the smaller network carriers in regional markets, such as Canadian, Swissair, Sabena and Ansett, all of which exited their markets.

3.3.22 Extension to a broader set of routes.
This new pricing scheme of an FSA responding to LCC entry is typically applied to a broad range of routes, not merely the ones with direct competition from the LCC. For example, on the trans-Tasman routes Air New Zealand has offered its Tasman Express product on all routes, not merely the four (of 9) major routes which Virgin Blue has entered or announced the launch of its service to date.

3.3.23 In part, this response on all routes is due to the threat or high likelihood of LCC entry into other routes. As well, carriers (FSAs and LCCs) have found that customers can and do substitute destinations. This is confirmed by evidence from the U.S. (shown in the next chapter) which indicates that the mere presence of LCC Southwest Airlines at one of the airports on an FSA route has reduced average fares. Carriers also point out that different pricing schemes on similar routes in a region leads to market confusion and undermines a carrier’s brand, hence the need for similar prices in different markets.30

3.3.24 Qantas, Air Canada and Air New Zealand have recently introduced new pricing policies for their respective domestic and transborder/trans-Tasman service networks. These carriers now offer one way fares, with different price tiers based on the date of purchase, seat availability, and on the level of service (especially the degree of flexibility of use and refundability of the ticket) the consumer desires. Qantas’ and Air Canada’s new one way pricing schemes include a business cabin product at reduced one way fares,31 indicating

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30 The statement of John Fondren Harrison describes (at paragraph 118) how the Tasman Express fare reductions were applied to all routes, including routes with no direct competitor. He also describes (at paragraph 92) why it is necessary to offer low fares on all routes.

31 In the case of Air Canada, current business cabin services on domestic routes are roughly 40% lower than previous business cabin fares. Until recently, it has not offered the reduced one way fares on transborder routes (either
the impact that the LCC pricing policy can have on the entire market.

3.3.25 The conclusion is that an LCC acts as a strong and enduring competitive constraint on the pricing of an FSA, including for high willingness to pay passengers. An LCC has lower costs as its product is inherently less expensive to provide, it uses a simpler form of price discrimination which generates significantly less revenue, and its impact is felt beyond routes directly served.

3.4 New challenges to FSAs from LCC presence in a market

3.4.1 Vulnerability of smaller FSAs.
Smaller FSAs are especially vulnerable to the challenge of LCC entry which reduces fares and eliminates restrictions. Smaller FSAs will lose revenues due to the new pricing policies in the market. While there is a portion of the market which still values the FSAs network services and service quality, it may favour a larger FSA with a more extensive network. The larger FSA’s stronger network, especially if it overlaps the smaller carrier’s network, gives it the advantage for those customers for whom network coverage, service redundancy, and service quality are most important.

3.4.2 Loss of Traffic Density – moving backward up the unit cost curve.
Even where an FSA seeks to reduce costs by simplifying in-flight and on the ground service levels, a loss of some traffic to LCCs results in the FSA moving backwards, up its unit cost curve, as it loses traffic density on a route. In this case, it is no longer able to exploit economies of traffic density on a route to the same degree as it had.

3.4.3 Traffic density is an important driver of unit costs. As an FSA loses traffic density on a route or system of routes, its unit costs rise. This is why few routes in the world support more than two carriers. The Statement of Michael Anthony Swiatek in this proceeding shows (at paragraphs 83 and 84) that almost 90% of routes with non-stop flights have only one or two carriers.

3.4.4 FSA financial viability requires re-establishing traffic density.
Medium to long term financial viability of an FSA subjected to competition from an LCC with one way fares requires that it reduce its costs to compensate for lower yields, as the loss of its former degree of price discrimination offers little prospect for increasing revenue. Unless the carrier can dramatically reduce its costs, which is made difficult by the inherent costs associated with the FSA model, it must re-establish economies of traffic density. In

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my opinion, this is likely to induce significant restructuring or consolidation in the FSA sector of the industry. This can be achieved by i) exit of a carrier (such as happened when Ansett exited); ii) a much smaller route structure with remaining routes achieving needed traffic density economies (this appears to be happening with the successor of Sabena, which operates only a fraction of the former Sabena’s routes, but it does not appear to be happening with the successor of Swissair, which has tried (unsuccessfully) to operate a very large portion of the routes of the former Swissair), or iii) by consolidation of FSAs (as happened when Canadian was merged into Air Canada, and when TWA was merged into American).33

3.4.5 A capacity hole is not required to support LCC growth.
Some have claimed that Virgin Blue’s success is due only, or even substantially, to the exit of Ansett and the corresponding removal of capacity from the market. This is the so called ‘capacity hole’ argument for LCC entry. However, as a general matter, a capacity hole is not necessary for an LCC to enter a market. Furthermore, it is not the case that Virgin Blue’s success is due only, or substantially, to a capacity hole, caused by Ansett’s exit.

3.4.6 First of all, the evidence elsewhere does not support the capacity hole hypothesis. For example, WestJet in Canada achieved its success prior to exit of Canadian Airlines. Further, when Canadian left the market it did so through merger, so that Canadian’s capacity was not immediately removed from the market.

3.4.7 In Europe, Ryanair, EasyJet and other LCCs expanded for a considerable period without any capacity reduction by FSAs.

3.4.8 Second, the success of LCCs is due to their lower costs and ability to charge lower prices to either divert traffic from FSAs or to stimulate new traffic. It is the fare charged which establishes the LCCs’ traffic base, not the evacuation of the market by incumbent FSAs.

3.4.9 A ‘capacity hole’ is not required for an LCC to be successful and expand. No ‘FSA failure capacity hole’ existed in Europe when Ryanair and EasyJet expanded, nor when JetBlue entered New York’s JFK airport.

3.4.10 Simply reducing labour costs will not solve the challenges faced by today’s FSAs.
Cost reductions are not simply a matter of reducing labour costs. Such costs are typically only between 25% and 40% of a network air carrier’s cost base. Even a 15% reduction in labour costs (either through lower wages or through productivity enhancements) will translate only into a 4-6% reduction in total unit costs. The source of the cost advantages of LCCs is much more extensive. These carriers have higher fleet utilisation, allowing them to serve a given amount of traffic with fewer aircraft. They typically operate with only

33 Note that Southwest had entered TWA’s hub at St. Louis prior to the merger.

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a single aircraft type, enabling significant savings in areas such as maintenance, training, dispatching, and the level of work force required, etc. They are successful at obtaining capital at lower costs (due to their high financial rankings and lower gearings), and operate with dramatically lower distribution costs.

3.4.11 An FSA which obtains lower labour costs from its workforce is only one step on a long path to being better able to compete with an LCC and re-balancing its costs with the lower yields driven into the market by the LCC.

3.4.12 Further, important FSA service elements are inherently costly and cannot be eliminated without fundamentally undermining the nature of the FSA’s product.

3.4.13 It should also be noted that the recent attempts to reduce costs by FSAs, especially in North America, are not realising all the hoped for cost savings:

- In Canada, the cost savings expected by Air Canada after it negotiated wage and productivity concessions from its organised labour (and achieved cost savings from managerial/analyst labour and from suppliers and other sources) are not being met. “Air Canada has told a court appointed monitor labour concessions agreed to by employees last year will fall short of the CA$1.1 billion target …” 34

- In the U.S., where US Airways reorganised under bankruptcy protection, United continues under bankruptcy protection, and American and other FSAs achieved major wage and productivity concessions under threats of bankruptcy, the actual record has been far short of expectations. The following table shows the weak cost savings achieved by U.S. FSAs. Even more interesting is how a number of prosperous U.S. LCCs have been able to achieve cost reductions under programs of continual cost reductions.

Table 1: U.S. carrier 2003 cost changes

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Change in costs per ASK calendar year 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FSAs</strong></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>-6.3%</td>
</tr>
<tr>
<td>Continental</td>
<td>2.5%</td>
</tr>
<tr>
<td>Delta</td>
<td>16%</td>
</tr>
<tr>
<td>Northwest</td>
<td>2.7%</td>
</tr>
<tr>
<td>United</td>
<td>-8.2%</td>
</tr>
<tr>
<td>US Airways</td>
<td>-3.3%</td>
</tr>
<tr>
<td><strong>LCCs</strong></td>
<td></td>
</tr>
<tr>
<td>Southwest</td>
<td>2.0%</td>
</tr>
<tr>
<td>AirTran</td>
<td>-2.7%</td>
</tr>
<tr>
<td>ATA</td>
<td>-16.5%</td>
</tr>
<tr>
<td>JetBlue</td>
<td>-5.4%</td>
</tr>
<tr>
<td>Southwest</td>
<td>2.0%</td>
</tr>
</tbody>
</table>


3.4.14 One reason for the inability of FSAs to achieve hoped for cost savings is due to the loss of economies of traffic density. U.S. FSAs have reduced their factor costs, but as they simultaneously lose traffic, the loss of traffic density economies forces their unit costs back up. For labour (and other) cost savings to have a lasting impact, an FSA must somehow restore its traffic level to previous levels. Further, it must do so while not undermining the characteristics of its product resulting in a loss of even that segment of market which is willing to pay for network connectivity and other FSA value added services.

3.4.15 Air New Zealand’s challenge.
For Air New Zealand, the impact of LCC entry is likely to be dramatic. [Confidential information.] When an LCC enters the domestic market, an event I view as being virtually inevitable, its domestic yields will plummet.

35 [Confidential information.]
3.4.16 It is interesting to note that Air New Zealand restructured its domestic and trans-Tasman operations prior to, but in anticipation of, the entry of an LCC. It simplified its domestic and trans-Tasman product and changed its price discrimination practice. Such adjustments are unlikely to forestall LCC entry, but merely somewhat better position it for the inevitable entry.

3.4.17 Consider Air Canada. As part of its financial restructuring, it has put a simple fare structure in place throughout its domestic market. This new fare structure has changed its price discrimination to be more in line with that of its LCC competitors. It now sells discounted one way fares in all domestic markets. Nevertheless, this has not prevented WestJet from launching new routes. For example, it recently commenced service on Ottawa-Gander, a very thin traffic route. (Gander’s population of 10,000 has been supporting a traffic base of roughly 100,000 passengers per year).

3.4.18 FSA response does not prevent LCC entry. This underscores two points. First, FSA response to LCC entry or expected entry does not necessarily forestall actual entry. The fact that LCCs have a cost structure lower than that of the FSAs makes it easier for LCCs to withstand any competitive response.

3.4.19 Second, even small markets have been revealed to support LCC service. An additional example of the latter is Ryanair’s service from Stansted to Ancona/Rimini, a small catchment area on the East Coast of Italy, or its service to Newquay in County Cornwall.36

3.4.20 As previously mentioned, the pricing policies LCCs are often observed to induce changes by the FSAs on routes not currently served by the LCC. Partly this is explained by the ability of travellers to drive to alternative airports. When WestJet entered the Moncton/Hamilton market, Air Canada responded with revised fare schemes on four adjacent routes.37 In addition, however, there are general market effects, in part because one destination may compete with other destinations for tourists, conventions, etc. Qantas (and Air Canada) now offers one way fares on almost all domestic routes.

3.5 Conclusion: LCCs constrain FSA prices

3.5.1 It is my conclusion that LCCs have dramatic impacts on the financial viability of FSAs.

3.5.2 Especially vulnerable are smaller FSAs with low traffic densities on their routes. LCC entry

36 It might be noted that LCCs may develop services to airports not currently capable of landing the aircraft in their fleet. In Canada, a number of airports without LCC service are actively planning to lengthen runways, add air navigation aids and/or make other changes to be able to handle an LCC’s aircraft.

37 Hamilton is roughly one hour driving time to Toronto. The four adjacent routes are Moncton-Toronto, Fredericton-Toronto, St. John NB-Toronto, and Charlottetown-Toronto. Fredericton, St. John and Charlottetown are less than 2 hours driving time to Moncton.
can force them backward, up the economies of traffic density unit cost curve, worsening
the unit cost – yield gap, or at best offsetting other attempts to lower costs and thus not
permanently solving the challenge of lack of long term financial viability. I noted that four
important FSAs of medium size have exited the industry when faced with substantial LCC
entry: Canadian Airlines International, Swissair, Sabena, and Ansett. In these cases, the
smaller FSA in the market was squeezed between a larger FSA and an LCC. Ryanair’s
service to Charleroi outside Brussels squeezed Sabena between it and FSA British
Airways on the important London-Brussels route. For this and other reasons, Sabena
exited the industry. Canadian was squeezed between WestJet and Air Canada, and
exited via merger into Air Canada.

3.5.3 No matter which market we examine – Australia, the U.S., Canada, or Europe, the
presence of LCCs, either on specific routes, on parallel routes or to alternative
destinations, changes the focus of FSA management and their market conduct.

3.6 A comparison of the FSA and LCC business models

3.6.1 There is some talk of a convergence between the business models of LCCs and FSAs. It
is my opinion that this is unlikely, even though on the surface it may appear that some
elements of one business model are being adopted by carriers in the other business
model.

3.6.2 The following table compares key elements of the two business models:
## Costs

<table>
<thead>
<tr>
<th>Element</th>
<th>LCC strategy</th>
<th>FSA strategy</th>
<th>Additional Comments</th>
</tr>
</thead>
</table>
| Costs    | Constantly striving to simplify processes and reduce costs. Have achieved continuing cost reductions. Have a corporate culture which supports continual cost reduction. | Collective agreements and network service complexity tend to build in ever more complex processes. Reforms are difficult to achieve. When cost reductions are sought, for many FSAs they tend to be “one off” initiatives, rather than the adoption of continuous improvement management strategies. Even where an FSA strives for continuous cost reduction, the FSA product is inherently more expensive to provide. | **A key differentiation between LCCs and FSAs.**  
A few recent cost initiatives by FSAs should not be confused with the LCC business model strategy with its focus on continuous simplification and cost reduction. |

## Hubs

<table>
<thead>
<tr>
<th>Element</th>
<th>LCC strategy</th>
<th>FSA strategy</th>
<th>Additional Comments</th>
</tr>
</thead>
</table>
| Hubs     | LCCs have major operations in large cities, where some passengers make connections. However the core focus is the O/D market. “Hubs” (or focus cities as some LCCs refer to them) are largely results of market sizes. | Hubs are strategic assets. Hubs are built and defended. | **A key differentiation between LCCs and FSAs.**  
The presence of a large number of LCC routes at a given major city should not be confused with an FSA’s strategic hub. |

## Hub connectivity

<table>
<thead>
<tr>
<th>Element</th>
<th>LCC strategy</th>
<th>FSA strategy</th>
<th>Additional Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hub connectivity</td>
<td>Connection opportunities are offered for sale when available, but are not a primary product dimension. ‘Acceptable’ connections times can be quite long.</td>
<td>Hubs are built to maximise the number of possible connections with shortest possible connection times. This results in the need for extra resources (e.g., more gates, more customer service agents,</td>
<td>Some FSAs have lengthened acceptable connection times (so called rolling hubs) but focus is still on maximising number of connections within the network. Perhaps a vernacular way of</td>
</tr>
<tr>
<td>Element</td>
<td>LCC strategy</td>
<td>FSA strategy</td>
<td>Additional Comments</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>more aircraft due to longer turnarounds) to accommodate large peak demands.</td>
<td>describing the comparison is that for an FSA, connections are planned and</td>
<td>‘connections happen.’</td>
</tr>
<tr>
<td>Interline connectivity</td>
<td>Interlining is rare. It requires significant additional costs and systems</td>
<td>Interline principles are a core concept for FSAs, dating back to the purpose</td>
<td><strong>A key differentiation between LCCs and FSAs.</strong></td>
</tr>
<tr>
<td></td>
<td>investments. Some interline connections are observed, but they tend to be</td>
<td>for establishing IATA in the 1940s. Substantial investments are made in</td>
<td>The fact that a few LCCs show interline services with FSAs or regional carriers</td>
</tr>
<tr>
<td></td>
<td>manual interlining from a very small carrier to the LCC (e.g., Rex - Virgin</td>
<td>message systems, baggage systems, computer reservation systems, facilitation</td>
<td>should not be confused with a strategy of adopting interlinability as one of the key business principles of FSAs.</td>
</tr>
<tr>
<td></td>
<td>Blue), or require the traveller to check-in again with the connecting</td>
<td>initiatives such as standardisation of product and rules (such as revenue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>carrier. Interlining typically amounts to simple selling of block space by</td>
<td>accounting and allocation between carriers), etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCCs without any value enhancement by the LCC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code share</td>
<td>Some cases exist (e.g., Virgin Blue with United, Air Tran with Air Wisconsin)</td>
<td>A key strategic practice which allows the FSA to sell a network of services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>but are relatively rare and not a major focus of the carrier. Due to the</td>
<td>larger than the route network operated.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>strategic focus on O/D traffic, LCCs generally do not seek expanded network</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>scope except for routes they serve themselves.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary airports</td>
<td>Some LCCs have used this as an important business strategy (e.g., Southwest,</td>
<td>FSAs often serve secondary markets in regions from their hubs, although not to the same</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ryanair), while others have</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>The use of secondary airports is no longer a key differentiation between LCCs and</strong></td>
</tr>
<tr>
<td>Element</td>
<td>LCC strategy</td>
<td>FSA strategy</td>
<td>Additional Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Alliances</td>
<td>Not observed.</td>
<td>A key strategic development in the 1990s to meet consumer demand for service from large network carriers.</td>
<td>A key differentiation between LCCs and FSAs.</td>
</tr>
<tr>
<td>Network scope</td>
<td>Profitable routes are served.</td>
<td>A key strategic dimension. FSAs’ strategy depends on serving those passengers for whom network scope is a prime demand element.</td>
<td>A key differentiation between LCCs and FSAs.</td>
</tr>
<tr>
<td>Network revenue impacts</td>
<td>Routes almost uniformly evaluated based on revenues for traffic on the route segment.</td>
<td>Route evaluation will often consider some portion of revenues on connecting segments when assessing the viability of a route.</td>
<td>A key differentiation between LCCs and FSAs.</td>
</tr>
<tr>
<td>Single aircraft type</td>
<td>LCCs typically operate a single aircraft type. Some indication that LCCs may adopt large regional jets, but even so their fleets will be relatively simple.</td>
<td>Because network coverage is a core strategic objective, FSAs attempt to serve as many markets as possible and connect them. This leads to the adoption of multiple aircraft types, with each suited to different route lengths and traffic densities.</td>
<td>The LCC chooses operational simplicity of a single aircraft type (or a small number of types) to keep costs down, and foregoes service on routes for which the chosen aircraft is not economical. FSAs trades off network coverage and service frequency for operating simplicity and cost.</td>
</tr>
<tr>
<td>Service features</td>
<td>Some LCCs focus only on bare bones services.</td>
<td>By strategic choice, as well as due to legacy</td>
<td>LCCs add services where revenues will</td>
</tr>
</tbody>
</table>
Increasingly LCCs are adding some service enhancements, such as lounges, frequent flyer programs, etc. However, these are provided on a fee for use basis.

<table>
<thead>
<tr>
<th>Element</th>
<th>LCC strategy</th>
<th>FSA strategy</th>
<th>Additional Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiosk based check-in</td>
<td>A cost reducing strategy</td>
<td>A cost reducing strategy</td>
<td>While some view that automated check-in services are a service enhancement, carriers view them as cost reduction strategies.</td>
</tr>
<tr>
<td>Customer Service orientation</td>
<td>Starting with Southwest, most LCCs have successfully developed a strong customer service culture. Service is given cheerfully.</td>
<td>Most FSAs have challenges in the attitudes of their employees toward customer service.</td>
<td><strong>A key differentiation between LCCs and FSAs.</strong></td>
</tr>
<tr>
<td>Product bundling</td>
<td>A key strategy is to unbundle airline services to passengers. The LCC offers a core product at a low price. Additional services, such as lounge access, meals and beverages are typically sold for premiums. Where frequent flyer rewards are offered, a higher fare typically must be booked. LCCs do not bundle any inter-airline connectivity services</td>
<td>FSAs offer bundled air services as a matter of strategic choice and legacy. This will include features such as network connectivity and convenience, lounge access at no charge for frequent travellers, on board meals on medium and long haul flights, and frequent flyer rewards.</td>
<td><strong>A key differentiation between LCCs and FSAs.</strong></td>
</tr>
</tbody>
</table>
3.6.3 The above comparison indicates that while some elements may appear on the surface to suggest a convergence of the two business models, there are fundamental strategic differences between their strategies. For example, while both may appear to operate hubs, for the FSA, the hub is a strategic asset requiring the deployment of resources to achieve strategic advantage, whereas for the LCCs, hubs are typically a consequence of market sizes.

3.7 Is Virgin Blue an LCC?

3.7.1 The preceding section listed the key differences between the LCC and FSA business models. The following table comments on Virgin Blue placement for each of the dimensions listed in Section 3.6.

<table>
<thead>
<tr>
<th>Element</th>
<th>Virgin Blue Strategy</th>
<th>Virgin Blue Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>Virgin Blue has a low cost structure, unencumbered by network connectivity, service amenities (except where the consumer pays a fee for such amenities), or legacy costs.</td>
<td>LCC</td>
</tr>
<tr>
<td>Hubs</td>
<td>Core focus is the O/D market.</td>
<td>LCC</td>
</tr>
<tr>
<td>Hub connectivity</td>
<td>Connection opportunities are offered for sale when available, but are not a primary product dimension. ‘Acceptable’ connection times can be quite long.</td>
<td>LCC</td>
</tr>
<tr>
<td>Interline connectivity</td>
<td>Interline agreement with United. But this requires passengers to move bags between flights and check in again. Has not invested in interline systems. Interline agreement with Rex, but manual processes used for the small number of connecting passengers</td>
<td>LCC – has not invested in interline systems.</td>
</tr>
<tr>
<td>Code share</td>
<td>Code share agreement with United, but no major code sharing strategy is apparent.</td>
<td>LCC</td>
</tr>
<tr>
<td>Secondary airports</td>
<td>None.</td>
<td>Less relevant in Australia.</td>
</tr>
<tr>
<td>Alliances</td>
<td>Not observed.</td>
<td>LCC</td>
</tr>
<tr>
<td>Element</td>
<td>Virgin Blue Strategy</td>
<td>Virgin Blue Assessment</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Network scope</td>
<td>Profitable routes are served.</td>
<td>LCC</td>
</tr>
<tr>
<td>Network revenue impacts</td>
<td>Routes almost uniformly evaluated based on revenues for traffic on the route segment.</td>
<td>LCC</td>
</tr>
<tr>
<td>Single aircraft Type</td>
<td>737-700 and 737-800</td>
<td>LCC</td>
</tr>
<tr>
<td>Service features</td>
<td>Provides value added services but where revenues for services at least cover costs</td>
<td>LCC</td>
</tr>
<tr>
<td>Kiosk based check in</td>
<td>Limited use at present</td>
<td>Both LCCs and FSA use kiosks.</td>
</tr>
<tr>
<td>Customer service orientation</td>
<td>Strong customer service culture. Service is given cheerfully.</td>
<td>LCC</td>
</tr>
<tr>
<td>Product bundling</td>
<td>Unbundled services. Passengers are either not provided with extra services or are charged a fee.</td>
<td>LCC</td>
</tr>
</tbody>
</table>

3.7.2 As can be seen, Virgin Blue has the characteristics of an LCC. While on the surface some elements of its services may seem to have FSA elements, it is not pursuing a business model which is converging on that of an FSA. Services such as lounges are provided but on a fee for use basis. Some interlining is provided, but Virgin Blue has not invested in interline systems. Processes are manual either for the passenger or to the carrier.
4.0 The Literature on the Impact of Industry Structure on Airline Prices

4.1 Introduction

4.1.1 I was asked to address the issue as to what economic theory and the economic literature demonstrates about the competitive significance for the airline industry of the introduction or potential introduction of an LCC, with or without a second FSA. In particular, what does the available data show about the effect of the introduction or potential introduction of an LCC, with or without a second FSA?

4.1.2 In Section 3, I discussed the FSA and LCC airline business models. There I used economic theory to discuss how LCCs constrain the pricing behaviour of FSAs. This is due both to their lower costs (hence prices) and their simpler and narrower price discrimination practices. Because a large portion of the consumers in a market with an LCC present find the LCC services substitutable for FSA services, the pricing levels and practices of the FSAs are severely constrained.

4.1.3 Section 3 also looked at the issue of economies of traffic density and how an FSA’s unit costs will increase when faced with a traffic loss to an LCC. Even as the FSA attempts to lower factor costs, reduced traffic density through market share loss offsets its best attempts at cost reduction.

4.1.4 This section of my report continues my investigation as to whether LCCs act as a constraint on FSA pricing.

4.1.5 The approach here is one of examining what the empirical literature in economics has revealed about the degree to which LCC presence on a route or on nearby routes constrains FSA prices.

4.1.6 The literature discussed here, and more fully in Appendix K, begins by examining the supposed impact that hub concentration had upon fares (the so called “hub premium”). This literature dealt specifically with hubs and used traditional measures of market concentration, such as large firm shares or Herfindahl-Hirschman indexes. But while the literature dealt specifically with hubs, it could be seen to put forward a more general proposition that market concentration both at hubs and on routes may lead to fare premiums. The first few (and widely cited) studies found large fare premiums at hubs, and led some to a conclusion that simply counting the number of carriers or using a Herfindahl-Hirschman or other market concentration index was an effective predictor of fares consumers would pay.
4.1.7 However, when examined further over a 15 year period, the literature reveals that, when controlling for factors such as route length, hub premiums are found to be significantly reduced and that such premiums are found to disappear when the LCC Southwest Airlines serves a market. This gave rise to studies focussing upon the impact of Southwest (the "Southwest Effect"), which revealed that Southwest imposed a considerable price constraint even where it did not fly a particular route, but only served an endpoint or operated on a parallel route. The literature indicates that this effect has generalised in recent years to other LCCs and is not unique to Southwest.

4.2 The record of airline prices after deregulation

4.2.1 In the early years after U.S. airline deregulation, there were a number of studies that looked at the impact of regulatory reform on air fares.

4.2.2 For example, the Australian Bureau of Transport Economics (1986) reported on the decline in real airline yields in the deregulated era. They concluded that "It appears that deregulation has been a major factor in the decline in real average yield."38

4.2.3 An often cited work by Morrison and Winston (1986) compared actual yields in the pre-deregulation era with yields predicted by the deregulation experience. They found that while in 1977, before deregulation, actual yields were 8.4 cents, they could have been 6.0 cents had the industry been deregulated earlier.39

4.2.4 In subsequent work, Morrison and Winston compared actual U.S. airline yields in the deregulated era with yields that would have prevailed based on the U.S. Civil Aeronautics Board price regulation formula which was in use up to the end of deregulation.40 As the following diagram extracted from their study shows, deregulation substantially reduced yields.

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38 Page 52.
39 Pages 14-15.
4.2.5 While the early literature focused on the benefits of regulatory reform, concern began to arise in the mid 1980s as to whether changes in market structure were having an adverse impact on fares in some markets, even though the overall record of deregulation was that it resulted in a large and significant reduction in fares paid by travellers.

4.2.6 As will be seen, an extensive literature has developed since the mid 1980s to address this question, although it was based almost exclusively on U.S. data and the U.S. experience with deregulated markets. It is not surprising that this literature largely arose from the U.S. It is the country with the longest experience with deregulation. It is also the only country with a publicly available data set on air fares paid by individual consumers.

4.2.7 This literature begins with a finding of market concentration at hubs leading to substantial fare premiums. However, over a fifteen year period, investigators discovered that:

a) there were other factors which explained higher fares at hubs, such as route length and a higher portion of business travel at major cities (which tend to be hubs);

b) controlling for these reduces the hub premium to 5% or less;
c) hub premiums seem to disappear when Southwest Airlines serves the market;

d) the Southwest effect exists even if Southwest does not fly a particular route but only serves an endpoint with other routes; and

e) the Southwest effect has generalised in recent years to other low cost carriers and is not unique to Southwest.

4.2.8 Some care is needed in applying the U.S. experience to competition policy in Australia. The U.S., for example, has 49 metropolitan areas with populations in excess of one million, and 174 with populations over 250,000. The U.S. also has the largest air carriers in the world with 6 of the largest 10 air carriers (ranked by revenues). It is one of the few markets capable of supporting more than one or two major carriers. Although the European Union taken collectively supports multiple air carriers, none are the size of the largest U.S. carriers.

4.2.9 A consideration of the U.S. experience does provide insights into markets in Australia, even taking into account its longer experience with deregulation and the presence of a mature, large LCC (Southwest).

4.2.10 To complement the findings in the literature from U.S. data, in subsequent sections of this report I look at evidence from Europe and Canada. Again, neither of these are totally identical to Australia’s market, but they may reveal whether the U.S. experience is robust and broadly reflected elsewhere. As well, Canada is a much smaller market. While still larger than that of Australia and New Zealand, it is much more similar in size. It faced the issue of a request by FSAs to consolidate, and its subsequent experience may provide some insight for Australia.

4.2.11 First, however, I address the literature from the U.S. on the effect of market structure on prices in airline markets. The literature examines a number of trends that have occurred since deregulation, such as:

- the development of the hub-and-spoke system;
- the rise of the LCC;
- alliances and mergers; and
- fare wars.

4.2.12 A detailed review of the literature can be found in Appendix K. What follows are the key

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41 U.S. population estimates for 1999.
findings from the literature.

4.2.13 It should be noted that this section deals with what actual data reveals about prices in airline markets. It is not game theory literature which postulates an assumption about how air carriers might behave in a market and then theoretically derives how carriers ought to behave.

4.3 **Hub Dominance Premium**

4.3.1 Hub-and-spoke systems evolved in the U.S. immediately following deregulation, as a way for carriers to increase revenues by providing better connections and frequencies for travellers.

4.3.2 In many instances, the hub airports became highly concentrated, with one or two airlines dominating the airport. This led to concerns that this concentration could act as a barrier to entry, allowing the dominating airline (or airlines) to raise fares on flights to and from the hub, commonly referred to as the hub premium. It was generally believed that such a premium would apply mainly to trips originating or terminating at the hub. Passenger trips connecting through a hub benefit from competition via other hubs, so any particular hub airline would be unable to charge a premium on connecting traffic.

4.3.3 Early research into the area of hub premiums took the form of comparisons of fares before and after a merger which resulted in airport hub dominance, or comparisons of fares at hub airports with those at non-hub airports. This led to a series of empirical papers which researched the existence and degree of any hub dominance premium.

4.3.4 An important paper was a study by the U.S. General Accounting Office (1990), which sought to quantify the hub premium. The study compared yields (average fare per mile) for trips originating at 15 U.S. hub airports dominated by one or two carriers with those originating at 38 unconcentrated airports. **This simple analysis concluded that yields at hub airports were 27% higher.**42 A hub airport was considered dominated if one airline accounted for at least 60% of all enplanements or if two carriers accounted for at least 80% of enplanements.

4.3.5 However, as was pointed out in subsequent research, these early studies made little attempt to adjust for other factors which impact yield, such as route distance, traffic mix, carrier identity, etc. For example, hub airports may have a higher proportion of business travellers, who typically pay higher fares, than non-hub airports as hubs tend to be based

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42 Like much of the research reported here, the GAO study makes use of Databank 1A (DB1A) of the U.S. Department of Transportation Origin and Destination Survey. The DB1A is a random 10% sample of all tickets that originate in the U.S. on domestic carriers.
near major cities.\textsuperscript{43} Thus, any observed hub premium may simply be due to the characteristics of travel demand at hub cities, rather than to market dominance.

4.3.6 One factor of particular importance was the \textit{stage length} of a route. Substantial costs are incurred in getting an aircraft off the ground to cruising altitude, and then getting it back down again. These are due to the characteristics of getting a heavy object into the air, as well as due to costs such as landing fees which do not vary with the stage length of a flight. Short routes will thus have higher costs per mile than longer routes, which can spread these fixed costs over more kilometres.\textsuperscript{44} This is relevant for measuring any hub premium since routes from hubs are shorter than non-hub routes. The latter will often include many long transcontinental flights. Hubs, on the other hand, are located more centrally, and, at least in the U.S., have significantly shorter routes. Thus, any observed hub premium may simply be a result of the shorter route distances, rather than due to exploiting market dominance.

4.3.7 One of the first studies to attempt to account for these factors which may influence the finding of hub dominance was Borenstein (1989). \textit{This is a widely cited paper and it found a substantially lower hub premium – only 6\%.} Borenstein described the findings as: a carrier which has a market share of 50\% at both endpoints of a route is able to charge fares 6\% higher than a carrier with a 10\% share at each endpoint. Borenstein points out that, although there is evidence of hub premium, hubs also provide many benefits to consumers which should also be taken into account, such as higher frequencies, easier connections and more non-stop flights.

4.3.8 More recent research on the hub premium has focussed on passenger mix - the proportion of business versus leisure travellers – among other factors. In their book, \textit{The Evolution of the Airline Industry} (1995), Morrison and Winston argue that previous analysis has not fully accounted for traffic mix, frequent flyer tickets, carrier identity and connecting services and, in some cases, distance. Specifically, they cited:

- Traffic mix – hubs may have greater proportions of business travellers (who generally pay higher fares) than non-hub as hubs tend to be based near large cities.

- Frequent flyer tickets – these have been excluded from previous analysis, but in fact, should be included, as frequent flyer travel represents a discount on travel. Typically, frequent flyer tickets tend to be more concentrated at hub airports so excluding them from analysis biases the average fares of hub airports upwards relative to non-hub fares.

\textsuperscript{43} It has been argued the higher business fares are, in part, a result of a higher cost of provision for these travellers. Business travellers demand high frequency, connectivity and last-minute availability, all of which imposes a cost on the airline.

\textsuperscript{44} The costs are fixed in the sense that they do not vary with the distance of the flight.
• Carrier identity – Delta may charge higher fares at its hub in Atlanta because it charges higher fares at all the airports it serves.45

• Preference for non-stop service – hubs tend to have a greater proportion of non-stop trips than non-hubs. Since trips requiring a connection are less attractive to travellers, they are likely to have a lower fare than a non-stop flight.

• To illustrate their point, the authors compared the hub premium estimated using the methodology used in the 1990 General Account Office study with one that controlled for the factors above. This analysis revealed that the hub premium was only 5.2% in 1993.

4.3.9 Morrison and Winston contend that the hub premium is much smaller than previously reported and even with the premium, fares are substantially below the levels that occurred before deregulation.

4.3.10 Further research by Morrison revealed that simply by removing airports which were served by Southwest from the control group, the fares at the concentrated airports were found to be 6% lower than the remaining airports.46

4.3.11 Conclusions
The issue of the hub premium has been controversial, but some conclusions can be drawn.

4.3.12 First, early studies estimated substantial premiums at hubs but failed to control for other factors such as route distance, traffic mix, frequent flyer reward tickets, and the presence of low cost carriers (the “Southwest effect”).

4.3.13 Second, more recent studies have attempted to control for these factors and have revealed a much smaller premium. In some cases the ‘premium’ has been found to be negative.

4.3.14 Third, investigation of hub premiums revealed that another factor was influencing fares paid. That is whether or not a low cost carrier such as Southwest is present in the market. While this was of secondary interest in the development of the literature, it indicated that the LCC effect was large – much larger than the effect of market concentration (hub

45 The carrier identity effect may represent that some airlines provide higher service levels and are able to earn a premium for these service levels on all routes, not merely routes at the hub. Higher service levels may be due to higher flight on-time performance, higher frequency, better in-flight or on the ground service levels, etc.

46 Let me clarify. When S. Morrison compared average fares at concentrated airports with a control group of unconcentrated airports that do not have service by Southwest, then the fares at the concentrated airports are actually lower.
dominance) on average prices paid by airline consumers.

4.4 **LCC/New Carrier Entry**

4.4.1 The literature on hub dominance revealed that the presence of an LCC on a route has a dramatic impact on average fares. This resulted in a new series of studies which examined the LCC issue in more detail.

4.4.2 In a U.S. DOT study, Bennet and Craun (1993) observed the impact of LCC Southwest Airlines on the California corridor routes. The LCC grew to become the largest carrier in the corridor, average fares on routes fell dramatically, and fares also fell on routes which Southwest did not serve.

4.4.3 Windle and Dresner (1995) found that while entry by an additional FSA resulted in only a 5% fare reduction after one year, entry by the LCC Southwest reduced average route fares by 48%. The impact of other non-network carriers was not as large as that of Southwest (at the time there were few LCCs other than Southwest) but at 20%, their impact on average fares were four times that of an additional FSA. Furthermore, their statistical analysis found that controlling for the impact on average fares of the presence of an LCC such as Southwest on a route was so large and significant that it made the regression results for traditional route concentration measures statistically insignificant.

4.4.4 Subsequent work by Dresner, Lin and Windle (1996), found that when Southwest began service at the Baltimore-Washington airport, the influence extended beyond the routes it served to other routes from this airport. Impacts on average fares on the unserved routes were observed to be reductions in the 18-40% range.

4.4.5 This result was echoed in work by S. Morrison (2001) which found that while Southwest’s presence reduced average fares on routes directly served by 46%, it reduced fares by 15-26% on routes it did not serve. He estimated that the benefit of Southwest’s presence in the U.S. domestic airline market was US$12.9 billion per annum.

4.4.6 Vowles (2001) further extended this line of research to determine that the Southwest effect impacted other nearby airports which were not served by Southwest.

4.4.7 Having studied the impact of Southwest, in the late 1990s researchers began to estimate the effects of LCCs generally, and no longer confined their investigation to the effect of Southwest. Other LCCs were emerging at this time with successful business models. Lin, Ito and Lee (2003) found that LCCs in general entered routes with fares 50% below those of the incumbents. An interesting finding, consistent with economic theory, is that LCC success on a route was higher as the price-cost margin existing prior to entry was higher. In other words, those routes with higher average fares are more likely to result in successful LCC entry.
4.4.8 Key conclusions emerging from the literature are that:

a) the presence of an LCC has a very large impact on average fares on an airline route;

b) the LCC impact on average fares is many times higher than the impact of an additional FSA on a route;

c) fares on adjacent routes (i.e., routes not served by the LCC, but where the LCC has service at one end of the route, or at a nearby airport) are also reduced; and

d) the impact of an LCC is felt at nearby airports it does not serve.

4.5 Alliances

4.5.1 Deregulation of aviation markets in the U.S. in 1978, and elsewhere over the next 15 years, led to a number of mergers between airlines within domestic markets, and to the development of a variety of domestic and international airline alliances. A small body of research has developed examining aspects of these mergers and alliances. Some of the literature focuses on the motivations for the mergers or alliances, while other literature examines the impact on pricing, consumer welfare, airline profits and competition.

4.5.2 The evidence available, however, does not support a conclusion that alliances create market power. Most of the evidence points to fare reductions, especially for passengers using connecting services. The evidence suggests, but does not quantify, the additional benefits to these consumers of improved connectivity.

4.5.3 Note that alliances are discussed more fully in Section 8 of this statement.

4.6 Conclusions

4.6.1 Appendix K provides a review of the economics literature on the effect of market structure on prices in airline markets. This literature is largely based on U.S. data, in part because it has the publicly available data on individual ticket purchases from which average prices can be computed.47 As well, the U.S. has had the longest experience with deregulated markets.

4.6.2 The U.S. based literature began with an investigation of whether hub dominance was resulting in exploitation of market power by the dominant hub carrier. From there, it branched out to investigate other issues, primarily that of the impact of low cost carriers on

47 Because of the large number of fare classes on any route, the use of any single published fare can conceal what consumers are actually paying in markets.
fares paid. A separate literature has begun to investigate the impact of international airline alliances on fares, although this is constrained by the lack of data on average fares paid by consumers.

4.6.3 The hub dominance literature initially indicated that fares were higher for trips that originated from hub airports. A 1990 study by the U.S. General Accounting Office (GAO), for example, suggested that the hub premium was 27%. As well, the literature indicated that fares were lower in markets served by 2 or more FSAs.

4.6.4 However, these findings by the GAO and others did not control for key market characteristics which might explain why hubs would naturally have higher fares, and did not examine the impact of the presence of an LCC in the market.

4.6.5 To address this, researchers began to estimate statistical regression models, which allowed for ‘explanatory’ or ‘control’ variables, which would separate out the effects of market characteristics versus hub dominance, if any.

4.6.6 While the GAO study found a substantial ‘hub premium’ in terms of higher fares per passenger kilometre (yields), it was found by later studies that most of the premium could be explained by the fact that trips from hubs tend to be of shorter distance than non-hub trips. Because there is a well known tapering of cost (and hence revenue) per seat kilometre with distance, the hub premium was disguising what was really a ‘short haul’ premium. Research by S. Morrison and Winston, for example, found that a 33% hub premium was reduced to only 5.2% when market characteristics were properly accounted for. The short haul effect, alone, accounted for almost 18% of the 33% fare premium.

4.6.7 Over a period from 1987 to 2003, a series of papers refined and expanded the investigation of the impact of market structure on fares. By 2003, the literature was indicating that:

a) the fare premiums in concentrated markets (such as hub premiums) are due to a very large extent to market characteristics (such as trip distance and whether a route serves a high portion of business trips) and not merely to market structure; and

b) the hub premium, if any, is 5% or less, with many studies finding premiums in the range of only 2-3%.

4.6.8 As the investigation of hub premiums progressed, research revealed that a strong determinant of average fare in a market was whether or not Southwest Airlines (the original LCC) was present in the market or not. This led to a literature extension to separately look at the effect of Southwest on average fares, and eventually to a more generalised effect of the presence or not of LCCs. This literature found that:
c) regardless of market structure, the presence of an LCC has a significant and dramatic impact on fares in the market;

d) the LCC effect is also present, although somewhat smaller, on routes where an LCC is not present but where an LCC serves one or both ends of the route; and

e) the LCC effect is much larger than any hub premium which might be present in a market. Impact of LCC entry, for example, was being observed as resulting in reductions of average fares paid of up to 48%, with several studies showing impacts above 30%. These impacts were being found whether or not a route had one or more endpoints from a hub with a dominant air carrier.

4.6.9 While the literature was not intended to address this question, it does suggest that if a choice has to be made between a market structure with one FSA and an LCC, versus one with 2 FSAs, the former results in dramatically lower prices in the market. This is true even if one or both of the two FSAs dominate a hub. The literature does not provide the ability to properly address the question as to what impact the presence of a 2nd FSA has in a market with an LCC, and this will be the focus of the next chapter.

4.6.10 A final observation is that there is a dichotomy in the literature between research conducted by or for government agencies and that conducted by the academic community. The former tends to focus on simple specifications that observe prices and then link price differences only to measures of market structure. The latter seek whether there are a variety of other explanations of market fare differences, and only after controlling for these is an attribution made to the effect of market structure. The studies which control for natural factors such as the shorter distance of hub routes find very small impacts of market structure on average fares paid by consumers.
5.0 **Empirical Evidence from the U.S. on the Impact on Fares of LCCs versus Additional FSAs**

5.1 **Introduction**

5.1.1 The previous section indicated that the U.S. based literature on the effect of market structure on prices paid by consumers indicates that the presence or not of an LCC on a route has a dramatically greater impact than whether there is a carrier that dominates a hub. The LCC effect on prices was often found to be in the range of 30-50%, whereas the hub dominance effect, after market characteristics were properly controlled for, was found to be 5% or less, with findings of 2-3% being common.

5.1.2 This literature clearly indicates that traditional market concentration measures, such as the percent of traffic carried by a carrier at a hub, are relatively unimportant determinants of the average fares paid in the market.

5.1.3 These empirical results suggest that if a choice has to be made between a market structure with one FSA and an LCC, versus a market structure with two FSAs, the former results in dramatically lower average prices paid by consumers. This is true even if one or both of the two FSAs dominate a hub.

5.1.4 While of significant value to the Tribunal, the literature was not designed to precisely address the question as to what impact the presence of a 2nd FSA has in a market with another FSA and an LCC, but rather was focused on addressing, or in the case of later literature, debunking notions of hub dominance.

5.1.5 To rectify this, this section presents new empirical evidence using a model designed to address the relative impact of a 2nd FSA in a market with an LCC.

5.1.6 The evidence put forth in this section is intended to complement that of Section 4. The literature reviewed there has led to strong conclusions regarding the great importance for average prices paid by airline passengers of the presence of an LCC on route, and the relative unimportance of traditional market structure measures. This section is not intended to replace the conclusions which come from the literature. Rather, the intent is to supplement those conclusions by estimating the same type of regression equation with the same data set but with variables in the regression which somewhat more precisely address the questions put to me by counsel --- that is, what is the impact on average air fares paid by consumers if a market has only one FSA and an LCC rather than two FSAs and an LCC.
5.2 The model

5.2.1 So as to be consistent with the existing literature, the supplementary empirical investigation in this section will use the same U.S. data and the same general structure of regression equations found in the existing literature on hub dominance and LCC impacts on fares. This is to ensure that any findings identify whether the absence or presence of a 2nd FSA has any effect, and that results are not due to use of different data or dramatically different regression specifications.

5.2.2 I use data on U.S. airline routes. The same DB1A database will be used for the analysis as has been used in most of the literature to date. This is a database of actual tickets purchased and used in the U.S. -- to be specific, a 10% sample of all domestic U.S. airline tickets. Because of coding errors which arise in the creation of a database of this magnitude, the data used in this analysis is filtered using the U.S. General Accounting Office’s fare screen. The resulting database of tickets was used to construct average fares and the level of traffic for individual routes.

5.2.3 I adopted a regression specification similar to that used by Morrison and Winston in a series of papers. These two authors have conducted the longest and most consistent series of studies on the issue of market structure on average air fares. Their work has been subjected many times to peer review and has been widely cited. It is the best available for investigating the effect of market structure and other factors on airline prices with the U.S. data. This model is a ‘reduced form’ specification of the determinants of average air fares on individual routes.

5.2.4 I did not conduct the statistical analysis myself. Instead, the analysis was conducted by other researchers, but to my specifications. The following specific procedure was used.

48 The primary data set for this study was the U.S. Department of Transportation's Ticket Origin and Destination Survey (Data Bank 1A) for calendar year years 1990 to 2000. The analysis covered the 1000 most heavily travelled domestic routes (identified in 2000). In order to be reasonably assured that the tickets for a particular trip reflect travel from one origin to one destination, only tickets with one (directional) destination were used. Round trips had to return to the initial point of departure (with no ground segments, i.e., no open jaw tickets). Only one-way tickets with two or fewer coupons (i.e., flight segments) and round-trip tickets with two or fewer coupons on the outbound and return legs were used. Because of possible coding errors in the data carriers submit to the Department of Transportation, the U.S. General Accounting Office's (1990) fare screen was used to screen out fares that seemed too high. In order to retain frequent flyer tickets in the analysis, and thus not overstate average air fares paid by consumers, a low fare screen was not used. A data point used in the regression is the average fare paid in a given quarter on a specific origin-destination route.

49 A reduced form equation for regression analysis is one which is derived from separate equations for supply and demand. The latter are referred to as the structural equations, and ‘solving’ the two structural equations for price results in the ‘reduced form’ equation. Both the structural and reduced form equations are subject to ‘simultaneous equations bias’. To correct for this, rather than use ordinary least squares to estimate the reduced form equation, an ‘instrumental variables’ regression procedure is used. This produces unbiased regression estimates of the coefficients of the reduced form price equation.
I specified the data set to be used (U.S. DB1A for 1990 to 2000, top 1000 routes, as per what most other researchers used, with the U.S. GAO data filter for coding anomalies). This is a panel data set, i.e., a cross sectional data set with observations through time.

Because a panel data set was used, time effects are included in the estimation.

The regressions analysed did not have firm effects, except as noted below in the 3rd regressions specification.

I specified the regression specification (or equation) to be estimated. This was a simple form of the regression equation used by S. Morrison and Winston, but with variables added which controlled for whether an LCC was present on the route, and whether the route had one versus two or more FSAs present. Variables are used in log form.

In addition to this basic regression equation, I also specified a regression equation which allowed me to test for whether the LCC effect is different for when LCC capacity on a route is small versus cases when an LCC operates with higher amounts of capacity.

The estimation technique used is instrumental variable regression analysis on a reduced form, with time effects.

5.2.5 The estimation was done by S. Morrison and Winston, at my request. It should be emphasised that the Morrison and Winston research team, merely conducted the analysis I specified. No attribution of the specification of the regression equation or the results should be attributed to them. They were neither asked for, nor did they give endorsement of the regression specification.

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50 I did not want to use data for 2001 and following so as not to distort results for the effects of 9/11 and recovery therefrom. Previous research was confined to pre-2001 data, and I wanted to obtain results which were based on a consistent data set.

51 Time effects are recognised to control for factors such as the general effect of inflation on fares over time, etc.

52 I controlled also for the presence of three and four or more FSAs.

53 Economists often use equations where variables are in the form of their natural logarithms. The coefficients of such regressions may be interpreted as average elasticities. The resulting regressions are constant elasticity models. More flexible specifications are possible, such as translog forms, which allow elasticities to vary. I did not use such specifications, as they have not been used in the literature to date, even by researchers with considerable experience in flexible function estimation such as Oum, Windle and Winston.
5.3 Results for Model which controls for LCC and FSA presence

5.3.1 Appendix L provides definitions of the variables used in the regression analysis.

5.3.2 Appendix M provides the results for the regressions I specified.

5.3.3 All of the columns are for regressions to explain the average fares on origin-destination routes.

5.3.4 The first column is for a regression which:

- Controls for route characteristics traffic density (lnpass), and route distance (lndist).
- Contains a variable to denote a hub with a dominant carrier, as per the GAO definition of what constitutes a hub market share considered to be dominant. (domhub)
- Contains variables to denote the type of route, such as whether it is between two large hubs, from a medium to a large hub, etc. (LL, ML, SL, ML, NL – large hub to non-hub, NM).  

- Has a set of year ‘dummy variables’ to control for general effects on fares over time, such as inflation, productivity improvements in the industry, etc. (Year1, Year2, …)
- Has a set of dummy variables to control for which quarter it is during a year, since fares have seasonal patterns. (Quart1, Quart2, …)
- Has a variable to denote whether an LCC is on the route. (LCC)
- Has a set of variables to denote whether the number of FSAs on the route is one, two, three, or four, or more. (FSA1, FSA2, …)
- Has a set of indicator variables for routes with an LCC and exactly one FSA; an LCC and exactly two FSAs, etc. (LCCfsa1, LCCfsa2, …)

54 The U.S. DOT definitions of what constitutes large, medium and small hubs is used. Other routes are non-hubs (N).
55 The econometric profession uses the term ‘dummy variables’ to denote a variable that simply indicates something about an observation (or point) in the data. A year dummy for 1994, takes the value of one if the data observation is from 1994 data, and takes the value of zero if it is from any year other than 1994. A better term might be that these are ‘indicator variables’.
56 It is necessary in regression analysis to exclude one dummy variable if there is also a constant in the regression. Here, it was decided to exclude the dummy for the presence of exactly one FSA on the route. In other words, the regression coefficients including the constant reflect the case of a route with one FSA. To analyse cases of two FSAs, the FSA2 coefficient must be added.
• Has a constant term. (CONST)

5.3.5 For each regression coefficient, the first row gives the coefficient value, the second row gives the standard error of the coefficient value in parenthesis, and the third row gives the ‘T-statistic’ – a test of the statistical significance of a coefficient. The last rows of the table give the R-squared measure of goodness of fit, and the number of observations used in the analysis.

5.3.6 The reason for doing this analysis was to investigate the effect of the presence of an LCC on a route, as well as the effect of the presence of two versus one FSAs on a route that had an LCC. These questions can be answered by examining combinations of the regression coefficients

• for the LCC presence;

• for two versus one FSAs (FSA1, FSA2); and

• for the combined presence of an LCC and FSA (LCCfisa1, LCCfisa2, …).

5.3.7 The following table provides the results of this analysis. It indicates the question to be addressed, provides the combination of regression coefficients required to address the question, and provides the result.
Table 2: Impacts of changes in number and type of air carriers on a route

<table>
<thead>
<tr>
<th>Question to be addressed</th>
<th>Coefficients arithmetic required</th>
<th>Result (standard error of result in parenthesis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the effect on average fares paid by consumers on a route if the market structure changes from service provided by 2 FSAs and one LCC, to a market structure with only 1 FSA and one LCC?</td>
<td>((\text{LCC} + \text{FSA1} + \text{LCCfsa1}) - (\text{LCC} + \text{FSA2} + \text{LCCfsa2}))(^{57})</td>
<td>(0.021) (0.015) (t = 1.43)</td>
</tr>
<tr>
<td>What is the effect on average fares paid by consumers on a route if the market structure changes from service provided by 2 FSAs and no LCC, to a structure with only one FSA and no LCC?</td>
<td>(\text{FSA1} - \text{FSA2})</td>
<td>(0.329) (0.054) (t = 6.05)</td>
</tr>
</tbody>
</table>

5.3.8  **If an LCC is on a route, the presence of 2 versus 1 FSA is of little or no impact on average fares.**

The results indicate that the observed effect of going from 2 FSAs to 1 FSA on a route with an LCC is to increase average fares by only 2.1%. This result is not statistically significant, and the 95% confidence interval ranges from +4.9% to –0.7%. This indicates that going from 2 FSAs to one FSA has a minor effect, if any, on average fares, provided there is an LCC on the route.

5.3.9  **If there is no LCC on a route, the presence of 2 FSAs rather than 1 FSA has a significant impact on fares.**

The second row of the above table asks what the effect is of going from 2 FSAs to 1 FSA if there is no LCC on the route. This indicates that fares would rise by roughly 33%. This is an interesting result, in that it reinforces the traditional view that airline markets with only a single FSA carrier face higher prices. Note that this regression did not control for the presence of an LCC on a parallel route or at an endpoint of a route. It is likely to be the case that the presence of an LCC on a parallel route or endpoint greatly reduces the importance of the presence of a 2nd FSA (discussed above, in Section 4.4).

\(^{57}\) FSA1 was dropped from the analysis, as previously indicated.
5.3.10 What is most important to observe is that it matters whether an LCC is in the market. Going from 3 FSAs to 2 FSAs increases fares by 8%. But from 2FSAs and one LCC (a three carrier market structure) to one FSA and one LCC (a 2 carrier market structure) has a statistically insignificant effect of raising fares by only 2%.

5.3.11 **What is the impact on fares when 2 FSAs are replaced by exactly one FSA and exactly one LCC in the market?**

The regression in the first column of Appendix M does not distinguish between cases where there are one versus two or more LCCs on a route. (There are a few markets in the U.S. which enjoy service from 2 or more LCCs.)

5.3.12 The regression in Column 2 of Appendix M attempts to clarify whether the results (that a 2nd FSA on a route with an LCC has little or no impact on fares) are influenced by these routes with multiple LCCs. The column 2 regression differentiates between markets with one LCC versus those with two or more. It replaces the LCC dummy variable with LCC1 and LCC2 dummy variables, with the latter indicating routes with 2 or more LCCs present and the former indicating routes with exactly one LCC.

5.3.13 The common coefficients in columns one and two of Appendix M are broadly similar.

5.3.14 This column 2 regression allows one to address the question of the effect of replacing an FSA with one and precisely one LCC.

5.3.15 The following table shows the results of changing competitors on a route from two FSAs to one FSA and one LCC. It also shows the results of changing the competitors on a route from 3 FSAs to 2 FSAs and one LCC.

**Table 3: Impact of replacing an FSA with an LCC on a route**

<table>
<thead>
<tr>
<th>Question to be addressed</th>
<th>Coefficients arithmetic required</th>
<th>Result (standard error of result in parenthesis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the effect on average fares of a route going from service by 2FSAs to 1 FSA and exactly one LCC?</td>
<td>(LCC1 + FSA1 + LCC1fsa1) - FSA2</td>
<td>-.809 (.032) t = -25.6</td>
</tr>
<tr>
<td>What is the effect on average fares of a route going from 3 FSAs to two FSAs and exactly one LCC?</td>
<td>LCC1 + FSA2 + LCC1fsa2 - FSA3</td>
<td>-.728 (.026) t = -31.3</td>
</tr>
</tbody>
</table>
5.3.16 The results show that the replacement of an FSA by an LCC has a dramatic and statistically significant impact on fares in the market.

5.3.17 **What is the impact of an LCC on average fares in market if the LCC only provides a small amount of capacity?**

The regression in the first column of Appendix M does not distinguish between the impacts of an LCC with a substantial portion of capacity on a route, versus the impact of an LCC that has only a small amount of capacity on the route.

5.3.18 The third column in Appendix M provides a regression specification which controls for the level of capacity offered by the LCC. It allows one to address the question of what impact an LCC has if it is only present in the market with a small amount of capacity. New variables have been added for the LCC’s capacity share. As well, because some of the criticisms of the literature reviewed in Section 4 suggested that the effect on average fares may differ for Southwest versus other LCCs, the third column regression also has an indicator for each LCC and its capacity share. The new variables introduced are:

- LnWNseatsTOT, denoting the total number of seats offered by Southwest (whose IATA designator code is WN) in the market.

- Similar variables are available for other LCCs:
  - WN (Southwest)
  - FL (ValuJet)
  - B6 (JetBlue)
  - TZ (ATA)
  - J7 (ValuJet)\(^{58}\)
  - F9 (Frontier)
  - NJ (Vanguard)
  - NK (Spirit)
  - QQ (Alliance Airlines)
  - W7 (Western Pacific)

- **Even an LCC with a small capacity share reduces average fares by 16%**.

First of all, the column three regression indicates that *the presence of an LCC with a capacity share of only 5% will reduce fares in the market by 16.4%. This finding has very high statistical significance. This impact of a small presence of an LCC is far greater (over seven times greater) than the impact of retaining a 2nd FSA on a route with an LCC.*

\(^{58}\) ValuJet had the J7 designator while it was operating. Today, its successor, Air Tran, use the FL code and J7 has been assigned to another airline.
An additional set of findings from the column three regression identifies the impact of each additional 5% traffic share of the various LCCs. The following table shows the logarithmic impact of each 5% increase in LCC capacity share on a route:

Table 4: Impact of each additional 5% capacity share of individual LCCs on average fares on a route

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Impact on average fares of each additional 5% traffic share by that carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>WN (Southwest)</td>
<td>-0.043</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td></td>
<td>t = -36.4</td>
</tr>
<tr>
<td>FL (Air Tran)</td>
<td>-0.028</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
</tr>
<tr>
<td></td>
<td>t = -18.0</td>
</tr>
<tr>
<td>B6 (JetBlue)</td>
<td>-0.040</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
</tr>
<tr>
<td></td>
<td>t = -11.2</td>
</tr>
<tr>
<td>TZ (ATA)</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td></td>
<td>t = -15.8</td>
</tr>
<tr>
<td>J7 (ValuJet)</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
</tr>
<tr>
<td></td>
<td>t = -14.5</td>
</tr>
<tr>
<td>F9 (Frontier)</td>
<td>-0.009</td>
</tr>
</tbody>
</table>

Logarithmic coefficients, such as those in Appendix M, are interpreted as percentage change impacts (expressed in decimal form (0.043 represents 4.3%). Thus the –0.043 coefficient for Southwest (WN) indicates that if the carrier’s capacity doubles (increases by 100% from 5% of the route’s total capacity to 10% of the route’s capacity), average fares will decline by an additional 4.3%.

ValuJet changed its name to AirTran Airlines (not to be confused with ATA) on 24 September 1997. The former ValuJet and AirTran Airways, two separate operations, were merged under one holding company. Almost all researchers treat post merger AirTran Airlines as separate from pre-merger ValuJet.
These results indicate that while there are differences among the LCCs, they all have a statistically significant impact. Southwest, JetBlue and Spirit both have larger impacts (4.0% to 4.5% reduction in average fares) for each additional 5% capacity share. But most of the other LCCs still have noticeable impacts, often with price reductions of at least 2% for each 5% increase in LCC capacity share.

To put these results in context, consider the expected impact on average fares if Southwest has a 30% traffic share. Then average prices on that route are expected to be 38% less than if the market had no LCC. As another example, if Air Tran had a 30% capacity share, the regression results indicate the effect would be that average fares paid by consumers would be 30% lower.

The impact of an LCC with a small capacity share on a route is dramatically higher than the impact of retaining a 2nd FSA when an LCC is present on a route. All of these impacts are dramatically higher than the impact of retaining a 2nd or 3rd FSA in a market with an LCC. Preserving a 2nd FSA on a route with an LCC reduces average

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61 This is computed as the 16.4% price reduction for being present on the route with at least 5% capacity share, plus 5 * 4.3% price reduction for going from 5% to 30% capacity share: 37.9% price reduction = 16.4% + 5*4.3%.
fares by only 2%, a result that is not statistically significant.

5.4 Conclusions

5.4.1 The literature review in Section 4 and Appendix K indicates that the presence of an LCC on a route has a substantial impact on average fares paid by air travellers. This impact is much larger than the effect that market concentration measures, such as whether or not a route has a dominant hub carrier, has on average fares.

5.4.2 This section was intended to supplement the conclusions of Chapter 4 by conducting some additional empirical analysis using similar data and regression equation specifications as those in the literature. The specific task was to investigate the impact on average fares paid by consumers when a route’s structure changed from 2 FSAs and an LCC to one with only one FSA and an LCC. It also addresses whether the impact of an LCC on average fares requires a high capacity share by the LCC on a route.

5.4.3 Key conclusions of this supplementary analysis include:

- Whether there are 2 or 1 FSAs on a route with an LCC has little or no impact on average fares paid by consumers. The impact of the 2nd FSA on fares was only to reduce them by 2.1%, a finding which is statistically insignificant.

- When the competitors on a route change from 2 FSAs to 1 FSA and exactly one LCC, average fares paid by consumers drop dramatically.

- Even when an LCC has a small (5%) capacity share on a route, it has a significant impact on the average fares paid by consumers. This impact is statistically significant and much larger than the impact of retaining a 2nd FSA on a route with an LCC.

5.4.4 While it is not the intention that too much weight be placed on these supplementary empirical findings, the results are consistent with conclusions drawn from the growing empirical literature on the effect of market structure on average air fares. That is, the results indicate that what is far more important than the number of carriers on a route is the type of air carrier. The presence of an LCC is the most important determinant of average fares paid by consumers.

5.4.5 Analysis which is based largely on numerical measures of market concentration, such as the number of air carriers or the market shares of dominant carriers, will overlook what is most important in today’s airline markets – the presence of LCCs is the most important determinant of market performance (as measured by average fares paid by consumers). The count of the number of carriers is of minor importance and statistically insignificant when an LCC provides service, even at small capacity levels.
6.0 Other International Evidence

6.1 Introduction

6.1.1 Section 4 focused on the large body of evidence on the impact of market structure on average airline fares from the U.S. experience in airline markets. This was supplemented by some additional empirical work in Section 5 which addressed the specific issues of the impact of a 2nd FSA in a market with an LCC, and whether small capacity by an LCC provides a constraint on FSA pricing. The study of results from U.S. airline markets is very valuable, since the U.S. is the only market with publicly available data on average fares in individual markets. It is also the aviation market with the longest experience with deregulation and the largest number of, and longest lived LCCs.

6.1.2 Care is needed in applying the U.S. experience to competition policy in Australia. The huge size of the U.S. market makes it likely that the conditions there will not be exactly replicated in Australia. The two countries also have different geographical layouts, with U.S. population widely dispersed, while Australia’s major population centres are focussed on the coasts.

6.1.3 Due to the factors considered above, it is prudent to examine experiences in other markets to see whether the U.S. experience is robust and generally applicable, and whether there are other lessons to be learned.

6.1.4 This section of my report looks at evidence from Canada and Europe.

6.1.5 Studying what happened in Canadian airline markets is useful, as it went from 2 FSAs to one FSA via a merger of Canadian Airlines International into Air Canada.

6.1.6 Europe has LCCs of size similar to that of Virgin Blue/Pacific Blue. Here I look at what the record in Europe says about prices in markets with 2 versus 1 FSA, when there is an LCC present in the market.

6.1.7 In both the Canadian and European cases, there are limitations on the data. Neither has the equivalent of the publicly available U.S. DB1A database. Instead, I have utilised data from the IATA Bank Settlement Plan (BSP) and other sources to assess fares on routes. The approach taken is one more akin to searching for cases studies and learning what the limited data reveals about those cases.

6.2 Canada - Background

6.2.1 The record on air fares in Canada is examined first.
6.2.2 As described above, Canadian airline markets transitioned, via a merger of Canadian Airlines International into Air Canada, from a market structure with 2 FSAs to one with a single FSA. At the time of the merger an LCC was present on some routes in Western Canada.

6.2.3 Canada deregulated its airline industry in stages, with formal legislation in place in 1988. Like Australia, Canada entered deregulation with a government ownership of air carriers. While Australia had a government owned international carrier and a government owned domestic carrier, Canada had one crown carrier which operated both domestically and internationally. As deregulation began, this carrier (Air Canada) was almost three times the size of the private carrier (CP Air, later named Canadian). Air Canada was privatised in two stages.

6.2.4 In the 1990s, Canadian Airlines suffered a series of financial crises and was re-capitalised several times. In 1999, its cash position deteriorated precipitously. At least three major reasons for this should be identified. First, Canadian faced competition from a new LCC, WestJet. WestJet began in Western Canada, which was the only part of the country where Canadian had a higher market share than Air Canada. WestJet’s low fares, available on a one way basis, almost immediately drained cash from Canadian. Canadian won a series of wage and work rule concessions from its employees, but was unable to restore profitability on the WestJet competitive routes – its revenue loss was too great.

6.2.5 Second, Air Canada overlapped Canadian’s route structure. Historically, Canadian served Asia on an exclusive basis, but Air Canada was granted access to key markets (Korea, Japan, Hong Kong, and Taiwan). Air Canada also was the major carrier to Europe and the Caribbean. With a smaller resource base, Canadian was unable to expand or improve its services in the face of Air Canada’s expansion, as well as continual expansion by foreign carriers. For example, Cathay Pacific and China Airlines (doing business as Mandarin Airlines) were aggressive in their expansion. Other carriers, such as Singapore, sought to expand aggressively but were constrained by a protectionist international air policy. Domestically, Canadian attempted to increase its city presence in key Eastern markets such as Toronto and Montreal, but faced continuing losses in those markets.

6.2.6 Third, Canadian was unable to generate adequate financial returns and suffered from continual capital starvation. When a quasi-open skies agreement with the U.S. was signed in 1995, Air Canada had the resources to expand aggressively across the border, adding up to 40 routes, while Canadian was unable to launch new services. Its more limited route network was becoming almost completely overlapped by Air Canada. Capital starvation.

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62 There were also regional airlines owned by provincial governments just prior to deregulation.

63 Canadian Airlines International was the result of merging CP Air into regional carrier PWA (which bought CP Air), along with a few other regional carriers and charter carrier Wardair.
also prevented Canadian from renewing an increasingly ageing fleet (domestic jet services largely used aged 737s and F-28s).

6.2.7 By 1999, Canadian faced bankruptcy or the need to merge into another carrier. Because of rigid foreign ownership rules in Canada, its only alternatives were bankruptcy or to seek a merger within Canada, i.e., with Air Canada. It sought and found an investor willing to purchase both Canadian and Air Canada, but Air Canada's management opposed the plan, and proposed to buy Canadian itself. After a bitter fight, Air Canada's management was the victor. As 2000 began, Canadian was restructured under bankruptcy protection and merged into Air Canada.

6.3 Canada - Case studies of losing an FSA

6.3.1 During the period following the merger of Canadian into Air Canada, a number of routes that had been served by two FSAs (Canadian and Air Canada) as well as by the LCC (WestJet), saw service reduced to one FSA and one LCC. Examining the experience with average fares on these routes may provide some insight as to the consequence of losing a 2nd FSA as a competitor on a route where an LCC is also present.

6.3.2 Using schedule from the OAG, I searched for all cases in Canada where a route had service by 2 FSAs and one LCC (specifically WestJet), and where that service was reduced to one FSA and one LCC. This required routes where the LCC was present prior to 2000, as after this date Canada had only one FSA.

6.3.3 OAG flight schedules were examined for the month of August for 1999, 2000, 2001, 2002 and 2003 for Air Canada, Canadian Airlines and WestJet. Eleven routes were identified which met the criteria of having been originally served by 2 FSAs and one LCC, but later by one FSA and one LCC. They are:

- Calgary – Edmonton
- Calgary – Kelowna
- Calgary - Regina
- Calgary – Saskatoon
- Calgary – Vancouver
- Calgary - Winnipeg
- Edmonton – Grande Prairie
- Edmonton – Vancouver
- Kelowna – Vancouver
- Prince George – Vancouver
- Saskatoon – Winnipeg

6.3.4 Most other routes in Canada were served only by the two FSAs, Air Canada and
Canadian, with no LCC on the route. For these routes market structure changed from 2 FSAs and no LCC to one FSA and no LCC. (Although many of these routes subsequently have received service from an LCC.)

6.3.5 For the years 2000-2003, InterVISTAS had access to IATA BSP data, from which we could construct a reasonable estimate of average fares on these routes paid to the FSAs and a few other smaller carriers. The BSP data, however, has no tickets sold by the LCC and thus likely overstates the average fare in the market. Nevertheless, the data is useful in that it reveals whether fares paid to the FSA went up or down as market structure changed.

6.3.6 The above data on average fares, however, cannot be extended prior to 2000, and thus it cannot be extended into the period when there were 2 FSAs and one LCC on the route. We can only observe fares after the merger of the 2 FSAs. However, later we look at some individual fares (not average fares) before and after the merger to reveal some of the effects on prices through the merger.

6.3.7 The average fare data on these 11 routes for 2000 to 2003 are shown in the following table.

**Table 5: Average FSA Return Fares of Domestic Canada Routes**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calgary-Edmonton</td>
<td>$348</td>
<td>$362</td>
<td>$218</td>
<td>$217</td>
</tr>
<tr>
<td>n (matched)</td>
<td>3,806</td>
<td>3,391</td>
<td>2,174</td>
<td>1,756</td>
</tr>
<tr>
<td>Calgary-Kelowna</td>
<td>$337</td>
<td>$374</td>
<td>$322</td>
<td>$261</td>
</tr>
<tr>
<td>n (matched)</td>
<td>887</td>
<td>671</td>
<td>242</td>
<td>190</td>
</tr>
<tr>
<td>Calgary-Regina</td>
<td>$409</td>
<td>$483</td>
<td>$359</td>
<td>$276</td>
</tr>
<tr>
<td>n (matched)</td>
<td>1,295</td>
<td>1,151</td>
<td>582</td>
<td>393</td>
</tr>
</tbody>
</table>

64 This is data on tickets which are cleared through IATA’s bank settlement plan. It covered roughly 60% of tickets sold in Canada, although that ratio is falling fast as internet bookings bypass the BSP process. Like the US DB1A database, this has records of individual tickets sold. However, there are some limitations. The BSP data that is available to use does not record the actual fare paid, but it does record the fare code. Using this, we matched the fare code with published fare prices listed in the ATPCo database and then constructed an estimate of average fares paid on routes. Not all BSP tickets could be matched to an ATPCo fare, but the average match was for 93% of tickets, with the worst case being 83% for one route for one year. The average fares do not include surcharges and taxes.

65 IATA was not making this data publicly available before Year 2000. Earlier data is coded differently and IATA is unable to provide it in a format for researchers.
<table>
<thead>
<tr>
<th>Routes</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>Calgary-Saskatoon</td>
<td>$377</td>
</tr>
<tr>
<td>n (matched)</td>
<td>994</td>
</tr>
<tr>
<td>Calgary-Vancouver</td>
<td>$456</td>
</tr>
<tr>
<td>n (matched)</td>
<td>10,026</td>
</tr>
<tr>
<td>Calgary-Winnipeg</td>
<td>$478</td>
</tr>
<tr>
<td>n (matched)</td>
<td>3,477</td>
</tr>
<tr>
<td>Edmonton-Grande Prairie</td>
<td>$343</td>
</tr>
<tr>
<td>n (matched)</td>
<td>705</td>
</tr>
<tr>
<td>Edmonton-Vancouver</td>
<td>$541</td>
</tr>
<tr>
<td>n (matched)</td>
<td>5,238</td>
</tr>
<tr>
<td>Kelowna-Vancouver</td>
<td>$293</td>
</tr>
<tr>
<td>n (matched)</td>
<td>1,885</td>
</tr>
<tr>
<td>Prince George-Vancouver</td>
<td>$290</td>
</tr>
<tr>
<td>n (matched)</td>
<td>2,497</td>
</tr>
<tr>
<td>Saskatoon-Winnipeg</td>
<td>$389</td>
</tr>
<tr>
<td>n (matched)</td>
<td>1,017</td>
</tr>
</tbody>
</table>

Source: IATA Aviation Information & Research (IATA BSP data August 2003 and other years) and ATPCo.
Notes: Fares are published base fares and do not include surcharges or taxes. Matching excludes Airmiles tickets.

6.3.8 The following plot shows the trends in these average fares.
6.3.9 The merger, and hence the loss of the 2nd FSA occurred in 2000, and thus we cannot observe the immediate impact of the loss of the 2nd FSA. As well, the data does not reflect the average fare in the markets, since data for tickets sold by the LCC is not available. These fares likely seriously overstate the actual average fares in the markets.

6.3.10 Nine of the 11 routes experienced higher fares in 2001, two years after the exit of the 2nd FSA, but by 2002 all but 3 of the routes had fares that were lower than they were in 2000. 2001 was a year marked by large increases in fuel prices, partially accounting for the increase in fares in 2001.

6.3.11 To examine fares during the implementation of the merger (from 1999 to 2000), we had to use fare data, rather than average fares. This was done by choosing an L class fare for each route. In Canada, the L fare class is used for special sales, and typically represents the best fare available. These sale fares are generally available only for short periods and unique fare codes are often used for each sale. The fare comparison was done for August in each year. August is the peak travel month in Canada on domestic services.

Figure 1: Fares on Canadian routes with an LCC and reduction in FSAs from 2 to 1

Northwest Airlines
which changed from two to one FSA

Calgary - Edmonton
Calgary - Kelowna
Calgary - Regina
Calgary - Saskatoon
Calgary - Vancouver
Calgary - Winnipeg
Edmonton - Grande Prairie
Edmonton - Vancouver
Kelowna - Vancouver
Prince George - Vancouver
Saskatoon - Winnipeg

Source: InterVISTAS Consulting Inc. computation using BSP data
6.3.12 The following plot shows the L-fare for 1999 to 2003 on these routes. Most important is what they show for 1999 to 2000, since this is the period when the routes were restructured from 2 FSAs and an LCC to 1 FSA and an LCC. The sale of Canadian to Air Canada was finalised in December 1999, operations were merged beginning in February 2000, and by April 2000 there was a consolidated schedule with seat management and pricing fully co-ordinated while the two information systems were merged.

This page is best viewed in colour

Figure 2: Discounted L Class fares on selected routes in Canada

Discounted Economy Fares
August 1999-2003 Return Fares (L-Class)

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calgary - Edmonton</td>
<td>$75</td>
<td>$95</td>
<td>$115</td>
<td>$135</td>
<td>$155</td>
</tr>
<tr>
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<td>$135</td>
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<tr>
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<td>$155</td>
<td>$175</td>
<td>$195</td>
<td>$215</td>
<td>$235</td>
</tr>
</tbody>
</table>

Note: In 2003, Air Canada did not operate the Calgary - Winnipeg and Edmonton - Vancouver routes. Zip airlines operated these routes instead.

66 The data is provided in table form in Appendix Q. This shows the fare, the fare code, the fare rule (which denotes the restrictions attached to the fare and which can be looked up in the ATPCo fare rules), and the advanced purchase and minimum stay requirements.

67 Note that the Calgary – Winnipeg route is no longer operated by Air Canada, but rather by its subsidiary Zip. Air Canada code shares on the Zip service, but apparently the lowest fares are those offered by Zip on its own code.
6.3.13 Most important to observe is that there is no consistent pattern of fare increases on these routes. Some routes had decreases and others had increases. In the first year after the merger, only three of the routes had increases in the lowest L fare greater than the rate of inflation. This was at a time when the average fare was increasing by 11% for domestic leisure tickets and 5% for domestic business tickets.\(^68\) The removal of the 2nd FSA resulted in higher prices, on average, and did have a detrimental effect on prices in airline markets. But on those routes where an LCC was present, this was not the case.

6.3.14 Note that the 1999/2000 experience in Canada is different from that faced in Australia today. At the time, Canada had an LCC present on only a handful of routes. Those routes did not experience the general post merger increase in average fares. (Since 2000, most major Canadian routes have an LCC present.) In contrast, in Australia today virtually all major markets have an LCC providing services.

6.3.15 Note also that the increase in fares in 2001, largely due to fuel price increases, is reflected both in the L-class fares in Figure 1 as well as in the previous average fares plot in Figure 2. While the average fares plot shows a strong downward trend after 2001, this is less evident in the L-class fare data. This suggests that the drop in average fares was likely due to increased availability of seats at the lowest fares, rather than due to decreases in the fares themselves.

6.3.16 In 2003, two of the routes were dropped from Air Canada’s mainline service, with replacement service by Air Canada’s new Zip subsidiary.\(^69\)

6.4 **Conclusions from the Canadian Experience**

6.4.1 In many ways the Canadian airline marketplace shares common traits with Australia. The sizes of the two markets are more similar than are the U.S. and Australian markets. Both domestic markets were restructured to result in only one FSA, although this happened by merger in Canada and by exit-via-bankruptcy in Australia. Both markets lack the type of geographic depth and dispersion found in the U.S. (and Europe). Thus, examining the Canadian experience is a useful complement to previously listed results from the U.S.

6.4.2 Eleven routes in Canada were identified which previously had two FSAs and one LCC, but

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\(^68\) The 11% and 5% average fare increases are based on data for the Province of B.C. Source: Tourism BC Study: "Airline Industry Restructuring Implications for BC Tourism" prepared for Tourism BC by InterVISTAS Consulting Inc., August 2000. The report is available at www.InterVISTAS.com. This study used the provincial average of average ticket price for the province of B.C. using BSP data. Data on individual routes was not available, only provincial BSP total ticket sales. The data excludes the increasing number of tickets sold by the LCC in the market. Five of the routes in the plot are routes to or within BC. Similar fare increases were found at the national level in a confidential study prepared for the Council of Provincial/Territorial Ministers Responsible for Tourism.

\(^69\) Calgary-Winnipeg, Edmonton-Vancouver.
which now have one FSA and one LCC. An examination of fare data for these routes indicated that in the first year after the merger (and the loss of the 2\textsuperscript{nd} FSA), those routes with an LCC did not experience major fare increases.

6.4.3 These Canadian results reinforce the conclusion found in the U.S. That is, where an LCC is present, fares are dramatically lower; that the LCC effect is present on adjacent routes; and that the presence of two FSAs resulted in higher fares than where there was only one FSA but an LCC.

6.4.4 The Canadian experience is also insightful for what happens to a 2\textsuperscript{nd} FSA when it faces an LCC and a better financed FSA whose route structure is increasingly overlapping it. Canadian market conditions were not able to support two FSAs as the LCC grew, and the envelopment of the routes of the 2\textsuperscript{nd} FSA by a better financed FSA combined to completely undermine the 2\textsuperscript{nd} FSA's financial viability, in spite of several financial restructurings.

6.4.5 It is my opinion that there is a substantial degree of relevance of the Canadian experience for Australian aviation markets. Evidence from the Canadian experience is fully consistent with the more extensive evidence from the U.S. and is from a market more similar in size and geographic concentration to that in Australia.

6.5 Europe – Analysis of routes with single versus multiple FSA competitors

6.5.1 Similar to the approach used with Canadian data, I also sought to identify routes in Europe with an LCC that had been served by 2 or more FSAs but were later served by only one FSA and the LCC. The usefulness of examining the European experience is to complement the evidence from the extensive literature in the U.S., so as to assess whether conclusions regarding the impact of a second FSA in an LCC market are robust.

6.5.2 Data for European markets is difficult to come by. While the BSP data used for the Canadian analysis is available for Europe, it has many gaps. Thus only a single year of data was available. This prevented time series analysis – i.e., looking at how fares change over time in response to changes in market structure. However the single year of data does allow cross section analysis – comparing fares for the same time period between routes with different market structures.

6.5.3 EasyJet’s set of routes were chosen for investigation. It is one of the two large LCCs in Europe and it serves a number of major routes. The other large European LCC, Ryanair, was also considered for investigation, but it serves a large number of unique routes with one or more secondary airports, or very small communities (such as London Stansted to Newquay Cornwall). In some cases, Ryanair’s routes might be considered as unique markets as a number of routes were previously unserved (such as London – Carcassonne). Therefore our analysis was confined to the EasyJet routes for better
The following plot graphically depicts the data. Different markers are used to differentiate routes served by EasyJet with 1 FSA; with 2 FSAs; and with three or more FSAs. Because of the well known effect that fares typically increase with distance, the average fares are plotted against route stage length.

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70 Data covered 47 routes served by EasyJet. We used BSP data to identify the fareclass of individual tickets in the BSP database and used ATPCo to determine the individual prices for each ticket. A small number of tickets were discarded due to the inability to match a BSP fare code with an ATPCo fare. In the case of the route from London to Zurich, we were unable to match a large number of specific V class fares and used one of the ATPCo V class fares (there is relatively little variation within V Class fares) to fill in the data. From the fares for individual tickets, an average fare for each route was constructed. However, the BSP database is largely confined to tickets for services on FSAs, and thus does not represent the true average fare on the route, which is likely to be lower for two reasons: the LCC average fare is typically less than an FSA average fare, and because some of the cheapest tickets of the FSA are sold on their web sites and do not move through the BSP.
6.5.6 If routes served by 2 or more FSAs are expected to have lower fares than routes served only by one FSA (plus EasyJet), then one would expect those routes with blue diamond markers to be at the bottom of the scatter plot, and those with the red circles to appear at the top of the scatter.

6.5.7 This does not appear to be the case, however. The routes with 1 FSA appear to be mixed within the routes with 2 or more FSAs.

6.5.8 Scatter plots can conceal information, so I also estimated a simple regression of average BSP fares for a route on route distance, route traffic levels or route capacity, and dummy

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71 We used 2002 ICAO "Traffic by Flight Stage" data to determine route traffic levels. Not every EasyJet route, however, has an entry in this publication, so fewer observations were available. As well, this data source is for service
variables to indicate whether a route is served by only 1 FSA, only 2 FSAs or 3 or more FSAs.\textsuperscript{72} Some variants were estimated, such as replacing the 2 and 3+ FSA indicates with a 2+ indicator, and adding a variable for whether EasyJet flies on the route.

6.5.9 The regression results are displayed in the table in Appendix P.

6.5.10 The results are generally insignificant. While most regressions have a statistically significant and properly signed coefficient on route distance, the coefficients on traffic level or capacity are not significant. None of the coefficients for 2 or more FSAs are statistically significant, and in fact, generally indicate that routes with two or more FSAs have higher average prices.

6.5.11 The European data do not support a hypothesis that the presence of a 2\textsuperscript{nd} FSA on a route acts as a further price discipline on an FSA competing with an LCC.

6.6 Conclusions from Canadian and European Case Studies

6.6.1 While the Canadian and European data are more limited than the data from the U.S., analysis of what was available does not support a hypothesis that the presence of a 2\textsuperscript{nd} FSA on a route acts as a further price discipline on an FSA competing with an LCC. To the contrary, the evidence from both Canada and Europe seems to indicate the irrelevance of the presence of two or more FSAs on routes served by an LCC.

6.6.2 This indicates that the results from the extensive U.S. literature on air fares are robust in that similar conclusions can be drawn from the Canadian and European experiences.

\textsuperscript{72} Regressions were in log form. Simple OLS was used.
7.0 Empirical Evidence using Australian Data

7.1 Introduction

7.1.1 Chapter 4 reviewed the U.S. based literature on the effect of market structure on average prices paid by airline consumers. Chapter 6 supplemented this by examining case study evidence from Canada and Europe. While the data for Canada and Europe is more limited than that from the U.S., it nonetheless is consistent with the U.S. findings that the presence of an LCC on a route results in substantially lower prices, and that provided an LCC is present, the exit of an FSA has no lasting impact on airline prices.

7.1.2 This chapter looks at evidence from Australian markets.

7.1.3 The Australian experience with low cost carriers is shorter than that in the U.S., in Canada or in Europe. It is also more difficult to analyse as entry of the LCC (Virgin Blue) and exit of the 2nd FSA (Ansett) occurred within 18 months of each other. These near simultaneous events make it difficult to statistically sort out the unique effects of LCC presence and FSA exit.

7.1.4 The approach adopted here is to first look at data on average prices (or more specifically, yield – which for a given market is average price divided by route distance) over a number of time periods to see whether it reveals significant increases after Ansett exited the market but Virgin Blue remained.

7.1.5 I then review and comment upon statistical evidence put forth by Winston and Morrison in the New Zealand Commerce Commission proceedings on this matter.

7.2 Evidence on Qantas’ Yields in Australian airline markets

7.2.1 As was discussed in Chapter 4, the U.S. DOT publishes an extensive data set on tickets purchased by passengers in the U.S. This allows researchers to construct average fares for individual origin-destination routings. The data includes all competitors, and it allows inclusion (or exclusion) of passengers travelling via connecting rather than non-stop or direct services.

7.2.2 Like Canada and Europe, such data does not exist in Australia. However, in his statement of 8 March 2004, Paul Edwards of Qantas provided confidential monthly data on Qantas’
7.2.3 This data does NOT fully reflect average prices (or yields) on individual domestic Australian routes, as it does not include fare data for Ansett, Impulse (prior to its acquisition by Qantas) or Virgin Blue. The exclusion of Virgin Blue likely results in a significant overstatement of average prices paid on Australian routes, as it has been the price leader, and its lower cost structure likely allows it to sustain lower average fares than Qantas. Thus, a finding using Qantas data that its yields did not rise after the exit of Ansett likely reflects that the average fare fell.

7.2.4 As well, even a modest increase in Qantas' yields after the exit of Ansett does not necessarily imply that average prices in the market rose. If it were possible to obtain data on Virgin Blue’s average fares, and combine this with the Qantas data, then the market average fare is highly likely to be below that reported only by Qantas.

7.2.5 Because the data produced by Mr. Edwards is confidential, my analysis of the data is provided separately, in Confidential Appendix Q.

7.2.6 The key findings from Appendix Q are that:

- Average fares on Qantas’ domestic routes generally fell significantly after Virgin Blue entered a route.

- When Ansett exited the market, in general Qantas’ average fares did not rise, other than temporarily.

- While there were some increases, they were small, still below the pre-Virgin Blue average fares, and in most cases returned to pre-September 2001 levels within a few months.

- Fares on most routes continued on a slight downward trend.

7.2.7 It should also be noted that the fare data displayed in Appendix Q do not yet reflect any fare decreases which may occur as JetStar services commence in the market.

7.2.8 It is thus my opinion that the Qantas confidential data support a conclusion that when an LCC is present in a market, a restructuring that results in the loss of a 2nd FSA will not

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73 The data is available in two separate data bases. For July 1997 to June 2002, Qantas collected data on route prices on a ‘net fare’ basis. From July 2001, its data collection system reported data on a ‘net-net fare’ basis, which is somewhat (3-4%) lower than the net fare data. There is a one year overlap of the two data sets. For the plots and charts presented in Confidential Appendix Q, I show the two series separately, and compute separate 12 month moving averages, so as not to distort the trends in the fares on the route. An alternative to displaying the separate data series would be to chain link the two series together. This is done for one route.
result in a sustainable increase in air fares.

### 7.3 Morrison – Winston Empirical Investigation of Average Fares in Australia

7.3.1 In their statement to the New Zealand Commerce Commission’s review of the Application by Qantas and Air New Zealand, Clifford Winston and Steve Morrison reported on an empirical analysis of average fares on Australian routes.

7.3.2 Their objective was to investigate the impact of market structure on average prices paid by domestic Australian consumers, using the same type of statistical regression analysis as they and other researchers have been using with U.S. data. Because the only data available to them on individual Australian routes is that on Qantas’ yields, which likely understates average price/yield on the routes, the analysis is limited. However, it has strong similarity with the U.S. methodology, and if anything, is likely to underestimate the impact of the presence of an LCC in the domestic Australian market.

7.3.3 The key coefficients in their analysis are:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Value</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
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<td>.04</td>
</tr>
<tr>
<td>Route distance</td>
<td>.4231</td>
<td>20.3</td>
</tr>
<tr>
<td>GDP</td>
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<td>.91</td>
</tr>
<tr>
<td>Presence VB</td>
<td>-.1118</td>
<td>-4.19</td>
</tr>
<tr>
<td>Presence of Ansett</td>
<td>-.0629</td>
<td>-6.6</td>
</tr>
</tbody>
</table>

7.3.4 Key conclusions reached by the authors are that the presence of Virgin Blue has a large and statistically significant negative effect on Qantas’ average fares on a given route (reducing them by 11.2 %), and that this effect is larger than the impact of the presence of Ansett on a route (which reduces Qantas’ fares by only 6.3%).

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75 Other parameters indicate that average fares on a route rise by 4.2% for each 10% increase in route distance, and that fares rise by 1.1% for each 10% increase in GDP.
the authors to conclude that “Competition supplied by low cost carriers often goes beyond competition on the route to include airport presence (potential entry) and presence on adjacent routes.”

7.3.5 It is worth noting that the Australian data Morrison and Winston used were only for Qantas. Thus they do not include the impact of the tickets sold by Virgin Blue on average airline fares in the market. Given that Virgin had no business class fares and that its unrestricted economy fares were notably less than those charged by Qantas, Virgin’s average air fares were undoubtedly lower than Qantas’. Adding Virgin’s data to Qantas’ would undoubtedly reduce the average fare in the market further than that in the Qantas data. Performing the statistical regression analysis on complete market data would yield an even greater reduction of average fares paid by consumers due to Virgin’s entry, and would reduce the impact of Ansett’s presence in the market.

7.3.6 As well, visual inspection of the data in Confidential Appendix Q demonstrates the clear impact of entry by Virgin Blue on Qantas yields, and the lack of an effect from the exit of Ansett on Qantas’ fares.

7.3.7 Thus, it is my opinion that the work of Morrison and Winston on Qantas’ average air fares correctly reflects the large impact of Virgin Blue on average air fares in the market, even at a time when Virgin was present in the market with only a small level of capacity. If anything, their work is more likely to be understating the impact of Virgin Blue on Qantas’ fares.

7.4 Conclusions from Australian data

7.4.1 The results from inspecting the Australian data, both visually as in Section 7.2, and by the more careful statistical regression analysis of Morrison and Winston discussed in Section 7.3 indicates that the Australian experience is fully consistent with what has been found with data from the U.S., Canada and Europe.

7.4.2 Specifically, the presence of a low cost carrier has a large impact on average fares paid by consumers, and that the exit of a 2nd FSA from a market, when an LCC is present, has a small impact, if any, on average fares paid by consumers.
8.0 Mergers and Alliances in the Airline Industry

8.1 Introduction

8.1.1 This section discusses mergers and alliances in the airline industry. A primary focus is on what theory says regarding the economics of airline mergers.

8.1.2 The two primary economic characteristics which favour large air carriers are:

- economies of traffic density; and
- consumer preference for services from carriers with large networks.

Thus there are both supply side and demand side forces favouring large air carriers.

8.1.3 The existence of economies of traffic density strongly favours any given route being served by a very small number of air carriers.

8.1.4 The consumer preference for services from carriers with large networks, combined with the effect of economies of traffic density, results in few sustainable carriers in a market.

8.1.5 It should be noted that other researchers have noted the same two forces which favour consolidation in the airline industry. For example:

"there are strong economic incentives for airlines to operate large, dense networks, through both higher revenue potential and lower unit costs. Compared with organic growth, mergers and acquisitions are a reasonably expeditious means of achieving a larger and denser network."\(^{76}\)

8.1.6 This chapter looks at the issue of economies of scale in the industry and forces for consolidation of the FSAs. I describe how consolidation is necessary, but how government policy regarding foreign ownership of air carriers is an impediment to mergers. In order to achieve many of the benefits of mergers, air carriers have developed a number of different types of alliance agreements. While falling short of the full marketing and cost efficiency benefits of outright merger, these alliances have provided significant benefits for carriers and consumers. As well, the importance of alliances for consumers in satisfying their demands for air travel services is discussed. Of special importance is the recently approved KLM-Air France transaction. This involves both an alliance and an equity investment and may be of some relevance to the current situation in Australia and New

\(^{76}\) Fan, Vigeant-Langlois, Geissler, Bosler and Wilmking (2001).
Zealand.

8.2  Economics of Mergers -- Economies of traffic density favour mergers

8.2.1 One reason for mergers in the airline industry is to achieve cost savings. The industry experiences substantial economies of traffic density. This means that for a considerable range of market sizes, it is cheaper per passenger to provide multiple flights by one air carrier (or to use larger aircraft) than it is to have multiple airlines, each providing a small number of flights. The presence of these economies throughout a substantial range of traffic levels is consistent with the relentless move within the industry to merge, whenever there are no barriers to mergers, such as foreign ownership restrictions.

8.2.2 The concept of economies of traffic density in airline markets was first discussed by Caves, Christensen and Tretheway (1979). Using data on U.S. air carriers, we were able to empirically verify the existence of economies of traffic density. This paper has been widely cited, including by the Australian Productivity Commission in its recent review of international air policy. Other studies have empirically confirmed the existence of airline economies of traffic density. For example, using Canadian data, Gillen, Oum and Tretheway (1990) found similar results.

8.2.3 In a 1985 study of the pre-deregulation Canadian airline industry, my colleagues David Gillen, Tae Oum and I addressed the issue of economies of traffic density and its implications for industry structure.77 At the time, the market was dominated by Air Canada, with over 50% market share. Competing with Air Canada and each other were CP Air and five regional carriers. Our analysis indicated that if CP Air and regionals were to merge, they would achieve a cost reduction of 13.3%, due to exploiting economies of traffic density.78 Within one year of the formal airline deregulation legislation in Canada, CP Air and the regionals (along with charter carrier Wardair) had merged to form Canadian Airlines International.79

8.2.4 The opposite side of economies of traffic density is that unit costs will rise, should a carrier lose part of its traffic base. I refer to this as moving backward, up the unit cost curve, as illustrated diagrammatically in the figure on the next page.

77 Gillen, Oum and Tretheway (1985).
79 Canadian was financially successful prior to its acquisition of Wardair in 1989. Many view that Canadian paid too high a price for Wardair, and that this coupled with the high debt required to finance the mergers, imposed financing costs which were difficult for the operationally efficient carrier to sustain. This financial burden was compounded by Canadian’s decision to invest in a new fleet of aircraft (A-320s, 747-400, 767) to remain competitive in its product offering with Air Canada and foreign air carriers. Canadian went through several partial restructurings and was beginning to show some financial success when it was faced by the entry of LCC WestJet in 1996. By 1999, Canadian’s revenue based and profitability had so deteriorated that it initiated merger into Air Canada.
8.2.5 It is not surprising, that given the existence of substantial economies of traffic density, most airline routes in the world are served by only one or two air carriers. In his statement, Michael Anthony Swiatek (at paragraphs 83 and 84) used data from the Official Airline Guide to document the point that only 10.3% of the routes in the world enjoy service by more than two carriers. Virtually 90% of the airline routes support no more than two airlines.

8.2.6 Today, FSAs are facing pressures for consolidation as LCCs acquire market share. In many, if not most markets, FSAs collectively will serve a declining share of the market and where LCC growth exceeds overall market growth, a declining traffic base. This means, that absent consolidation via merger or via failure and exit of some FSAs, the FSA carriers as a group and individually will experience traffic loss. This, in turn, means that they will move backwards, up the economies of traffic density curve.

**Figure 4: Moving Backward, up the unit cost curve**

The relationship between unit cost and traffic density can be seen using the U.S. data for 2003 reported in Section 3.4. The following table repeats that data and supplements it with the change in traffic for each carrier.
Table 6: 2003 U.S. Carrier Cost Reductions and Change in RPMs

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Change in costs per ASK (calendar year 2003)</th>
<th>Change in system-wide RPMs (calendar year 2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSAs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Airlines*</td>
<td>-6.3%</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Continental Air Lines*</td>
<td>2.5%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Delta Air Lines</td>
<td>16%</td>
<td>-3.3%</td>
</tr>
<tr>
<td>Northwest Airlines</td>
<td>2.7%</td>
<td>-4.9%</td>
</tr>
<tr>
<td>United Air Lines</td>
<td>-8.2%</td>
<td>-4.6%</td>
</tr>
<tr>
<td>US Airways</td>
<td>-3.3%</td>
<td>-5.6%</td>
</tr>
<tr>
<td>LCCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AirTran Airways</td>
<td>-2.7%</td>
<td>28.0%</td>
</tr>
<tr>
<td>American Trans Air (ATA)</td>
<td>-16.5%</td>
<td>15.9%</td>
</tr>
<tr>
<td>JetBlue Airways</td>
<td>-5.4%</td>
<td>68.6%</td>
</tr>
<tr>
<td>Southwest Airlines</td>
<td>2.0%</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

Sources:

8.2.8 All of the U.S. FSAs reported traffic declines in 2003. Three experienced increased unit costs, and three experienced small declines in unit costs. In contrast, all of the LCCs reported traffic increases. Those LCCs with large traffic increases reported declines in unit costs. Only Southwest, whose traffic grew only by 5.6% (but a large growth rate relative to the U.S. FSAs,) reported a unit cost increase.

8.2.9 The data from the table are displayed graphically in the next figure.
8.2.10 While there is a scatter of points, it can be seen that carriers with high traffic growth experienced declines in unit cost, and that all but one carrier with an increase in unit cost experienced a traffic decline.

8.2.11 One might ask why U.S. carriers that claim reductions in wages and other factor costs, ended the year with increased unit costs. One way to reconcile these apparent inconsistencies is shown in the next diagram. Here a carrier starts at point A and achieves a reduction in factor costs. This shifts the carrier down to a lower unit cost curve. However, if the carrier lost traffic to a low cost competitor which resulted in a decline in traffic, then it would move backward up the new, lower, cost curve to point B. Reductions in factor costs such as wage rates are more than offset by a rise in unit cost due to loss of traffic density economies.
8.2.12 The need for consolidation of the FSAs is a simple matter of mathematics. Consider the case of Europe, where overall scheduled traffic is expected to grow at a rate of 4.9% per annum to 2012.\textsuperscript{80} With the LCCs in Europe approaching a 30% traffic share, and postulating that the LCCs will collectively grow only 20% per annum (see Appendix F to see the exceptional growth rates of LCCs), then the European FSAs must contract at a rate of 1.6% per annum. If the LCCs grow at 25% per annum, as seems likely, then the FSAs collectively must decline 3.7% per annum. As the LCCs approach a 40% traffic share, even if their growth rate slows to 15% per annum, it implies that the FSAs will decline 1.8% per annum.

8.2.13 Thus, even with 4.5% per annum growth of the total market, the large growth of the LCCs will result in an ever smaller FSA industry in Europe. Only at a total market growth rate of 6% per year can the FSA industry remain the same size, if the LCCs grow at a 20% rate per annum.

\textsuperscript{80} Boeing’s 2003 Current Market Outlook forecasts the Europe-Europe traffic (which in 2002 totalled 454 billion RPKs and in 2012 will reach 731 billion RPKs) will grow at an average annual rate of growth of 4.89% to 2012 for the European market.
8.2.14 Faced with this magnitude of potential contraction, the pressures for the FSAs to merge in order to maintain existing economies of traffic density are formidable.

8.3 Economics of Mergers -- Consumer Preference for Large Network Air Carriers.

8.3.1 A second reason for mergers has been to satisfy consumer demand. Consumers generally prefer service by carriers serving large networks, even when their itinerary for any given trip is simple.81

8.3.2 In my book Airline Economics, co-authored with Prof. Tae Oum, I comment on the reasons for this as follows:82

In practice, there are at least three reasons why consumers prefer large airlines. One reason is due to information costs. A traveller knows that a large carrier can get him or her to just about anywhere in the country, while smaller carriers serve only a limited number of communities. Travel agents act as intermediaries for the consumer, but even here large network airlines have an edge, such as when an agent in one region needs to book flights in other regions.

A second reason why consumers favour large airlines is attributable to the higher quality of service these airlines offer. If connections must be made, less of the traveller’s time will be required with a single airline than when the trip involves switching airlines because single airline flight connections are more likely to be timed to minimise waiting time at intermediate points (hubs). Consumers are also aware that there is a lower probability of baggage being lost or delayed with a single airline, as well as a higher probability that the same airline’s outbound flight would be held for a traveller on a delayed inbound flight.

The third factor causing consumers to favour larger over smaller carriers is the existence of frequent flyer programs. These programs reward the individual for patronising a single carrier (even though the fare for business travellers may be paid by their employers). It is much easier to accumulate points with an airline that flies to a large number of destinations.

8.3.3 An early paper studying the economics of the North Central – Southern merger to form

81 Note that this phenomena is not confined to the customers of FSAs. Consumers prefer LCC service from large network carriers. There have been mergers of LCCs, such as Southwest’s purchase of Morris Air to expand its network coverage.

82 Tretheway and Oum (1992). See page 17-18 in the section titled “Demand Side Forces Favouring Large Air Carriers.”
Republic Airlines found empirical evidence for a strong consumer preference for same airline service.\(^8\) If their 1979 findings are updated for inflation and converted to Australian dollars, the value they found for same airline service is roughly A$42 per trip. This is the size of the premium which consumers have revealed themselves willing to pay for service on a large network airline rather than receive service on a carrier with a limited network. The magnitude of this is significant. In a market serving 5 million annual trips, service on a large network carrier creates value to the consumer of over $200 million per annum, compared to service by a number of limited network carriers.

### 8.3.4
The importance of being able to provide the airline consumer with a large network was echoed several times in the statements of lay witnesses. Air New Zealand CEO Ralph Norris, for example, commented:

> “In order for Air NZ to compete effectively in the international market as a network carrier, ... Air NZ needs to serve an international market and offer its passengers a seamless service across its whole network ... this may include having to form alliances with other airlines to allow passengers to seamlessly reach destinations not served directly by Air NZ flights...”\(^8\)

He further comments on the challenge posed to Air New Zealand from competitors with larger networks:

> “In 2002 Air NZ needed to take steps to keep its international long haul product offering competitive against larger carriers which were operating on a number of routes which overlapped with the international long haul routes and international short haul routes on which Air NZ was operating. ... These larger carriers had ... larger networks which offered greater depth (more frequency of services) and greater breadth (more destinations and connections) than Air NZ, ...”\(^8\)

### 8.3.5
A number of mergers in the U.S. were consummated specifically to increase the breadth and depth of network that could be offered to consumers. Among others, these included:

- National into Pan Am;
- North Central, Southern and Piedmont to form Republic;
- Republic into Northwest;
- Ozark into TWA;

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\(^8\) Carleton, Landes and Posner (1980).

\(^8\) Statement of Ralph James Norris, at paragraph 80.

\(^8\) At paragraphs 81 and 82.
• PSA into US Air (now US Airways);
• the acquisition of the Pacific route system of Pan Am by United;
• the acquisition of the European route system of TWA by American; and
• Reno into Southwest.

8.3.6 Outside of the U.S., there have been mergers to increase network scope. Among these are:
• the merger which created British Airways from BOAC and BEA;
• the merger of UTA into Air France;
• the merger of Australian into Qantas; and
• the acquisition of Ansett Australia by Air New Zealand.

8.4 Record of Airline Mergers

8.4.1 The following table lists some of the major mergers which have taken place in the airline industry over the past 25 years. It includes mergers of FSAs as well as mergers of LCCs.

Table 7: List of Selected Airline Mergers Since 1978, ordered by country of merging airlines

<table>
<thead>
<tr>
<th>Year</th>
<th>Airlines</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>North Central, Southern to form Republic</td>
<td>United States</td>
</tr>
<tr>
<td>1979</td>
<td>Pan Am acquires National</td>
<td>United States</td>
</tr>
<tr>
<td>1980</td>
<td>Republic acquires Hughes Airwest</td>
<td>United States</td>
</tr>
<tr>
<td>1981</td>
<td>Continental merges with Texas International</td>
<td>United States</td>
</tr>
<tr>
<td>1985</td>
<td>People Express acquires Frontier</td>
<td>United States</td>
</tr>
<tr>
<td>1985</td>
<td>Southwest acquires Muse</td>
<td>United States</td>
</tr>
<tr>
<td>1986</td>
<td>Continental acquires People Express</td>
<td>United States</td>
</tr>
<tr>
<td>1986</td>
<td>Northwest acquires Republic</td>
<td>United States</td>
</tr>
<tr>
<td>1986</td>
<td>TWA acquires Ozark</td>
<td>United States</td>
</tr>
<tr>
<td>1986</td>
<td>Delta acquires Western</td>
<td>United States</td>
</tr>
<tr>
<td>1987</td>
<td>American acquires Air Cal</td>
<td>United States</td>
</tr>
<tr>
<td>Year</td>
<td>Airlines</td>
<td>Region</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>1987</td>
<td>USAir acquires Pacific Southwest</td>
<td>United States</td>
</tr>
<tr>
<td>1987</td>
<td>USAir acquires Piedmont</td>
<td>United States</td>
</tr>
<tr>
<td>1992</td>
<td>USAir acquires Trump Shuttle</td>
<td>United States</td>
</tr>
<tr>
<td>1992</td>
<td>United acquires but does not merge Air Wisconsin</td>
<td>United States</td>
</tr>
<tr>
<td>1993</td>
<td>Southwest acquires Morris Air</td>
<td>United States</td>
</tr>
<tr>
<td>1997</td>
<td>ValuJet acquires AirTran Airways (surviving brand)</td>
<td>United States</td>
</tr>
<tr>
<td>1999</td>
<td>American acquires Reno Air</td>
<td>United States</td>
</tr>
<tr>
<td>1993</td>
<td>Qantas acquires Australian</td>
<td>Australia</td>
</tr>
<tr>
<td>2001</td>
<td>Qantas acquires Impulse</td>
<td>Australia</td>
</tr>
<tr>
<td>1988</td>
<td>Thai Airways International acquires Thai Airways Company</td>
<td>Asia</td>
</tr>
<tr>
<td>2002</td>
<td>China Eastern Airlines acquires Wuhan Airlines</td>
<td>Asia</td>
</tr>
<tr>
<td>2002</td>
<td>Japan Airlines and Japan Air System merge to form Japan Airlines System Corp.</td>
<td>Asia</td>
</tr>
<tr>
<td>1987</td>
<td>Air Canada acquires Austin Airways, Air Ontario</td>
<td>Canada</td>
</tr>
<tr>
<td>1987</td>
<td>CP Air acquires Eastern Provincial, Nordair, Pacific Western</td>
<td>Canada</td>
</tr>
<tr>
<td>1987</td>
<td>PWA acquires CP Air, renamed Canadian</td>
<td>Canada</td>
</tr>
<tr>
<td>1989</td>
<td>Canadian acquires Wardair</td>
<td>Canada</td>
</tr>
<tr>
<td>2000</td>
<td>Air Canada acquires Canadian Airlines</td>
<td>Canada</td>
</tr>
<tr>
<td>2001</td>
<td>Canada 3000 acquires Royal Airlines, CanJet</td>
<td>Canada</td>
</tr>
<tr>
<td>2003</td>
<td>Air China, acquires China Southwest Airlines, Zhejiang Airlines</td>
<td>China</td>
</tr>
<tr>
<td>2002</td>
<td>EasyJet acquires Go (former BA subsidiary)</td>
<td>Europe</td>
</tr>
<tr>
<td>2003</td>
<td>Ryanair acquires Buzz (from KLM)</td>
<td>Europe</td>
</tr>
<tr>
<td>2004</td>
<td>Air France, Royal Dutch Airlines (KLM)</td>
<td>Europe</td>
</tr>
<tr>
<td>1978</td>
<td>TEAL (Air New Zealand) and NAC merger to form Air New Zealand</td>
<td>New Zealand</td>
</tr>
<tr>
<td>1996</td>
<td>Air New Zealand acquires Ansett Australia</td>
<td>New Zealand</td>
</tr>
</tbody>
</table>

8.4.2 There are a number of observations to note.
8.4.3 First, many mergers increased the network scope of the acquiring carrier.

- There have been a large and continuing number of mergers within the U.S., from the first year after deregulation (1979, Pan Am – National) to the 2001 American – TWA merger.

- Canada saw a series of mergers of CP Air and several regional carriers to form Canadian in 1987,86 and later saw the merger of Canadian into Air Canada. Canada now has only one FSA.

- France saw the merger of domestic FSA Air Inter into Air France. Air France also acquired UTA (a limited network long haul carrier) and some regional carriers.

- Australia saw the merger of domestic FSA Australian into international FSA Qantas.

- In Japan, Japan Airlines acquired Japan Air System.

8.4.4 Second, mergers of international airlines take place only within a single country. This is due to foreign ownership restrictions, discussed later. One exception is that mergers have taken place within the European Union, although these carriers generally are not allowed to operate outside of the EU.87

8.4.5 Third, there have been mergers of both FSAs and LCCs. Southwest acquired Muse Air and later acquired Morris Air. The latter was an operation from Salt Lake City which was then outside the Southwest route system.88 Air Tran was formed from the merger of ValuJet and Air Tran Airways. In the EU, both Ryanair and EasyJet have purchased other LCC carriers. EasyJet purchased GO, which originally was a British Airways subsidiary, later sold to its management team, which later sold out to EasyJet. Ryanair purchased Buzz, which was a KLM subsidiary.

8.4.6 Fourth, in those countries that had multiple FSAs, almost every single major FSA has been involved in a merger. Each of the major U.S. carriers have had mergers in their history since deregulation: American, United, Delta, Northwest, Continental, US Airways and FedEx. Canada’s FSAs merged into a single entity. Qantas in Australia acquired Australian. British Airways was created from several mergers. Air France acquired Air Inter and UTA. Japan Airlines is acquiring Japan Air System.

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86 Canadian was formed in 1987 from the merger of PWA into Canadian, which in turn had acquired EPA, Nordair and parts of Quebecair. In 1989, Canadian acquired charter carrier Wardair.

87 There are a few exceptions to this rule. The EU has undertaken treaties with Norway, Iceland and Liechtenstein (but not Switzerland) which allows EU owned carriers to operate to their territories without restriction on which EU member state the carrier is based in or in which its owners reside.

88 The CEO of Morris Air later went on to found JetBlue and was instrumental in the formation of WestJet.
8.4.7 This evidence indicates that the pressures for airline consolidation are observed throughout the world. Every major market that had multiple carriers has seen some degree of merger activity.

8.5 Barriers to mergers

8.5.1 While it is the usual practice to consider barriers to entry, in the air transport industry, it is my view that there are regulatory barriers to merger which are the single most important factor today impeding evolution of the airline industry to a more optimal industry structure.

8.5.2 The more optimal industry structure is one with the presence of LCCs, and where FSAs are able to consolidate, so as to maintain or enhance network connectivity, while maintaining or increasing economies of traffic density on individual routes.

8.5.3 There are two government imposed barriers to mergers: restrictions on foreign ownership of airlines, typically embodied in national law; and ownership and control provisions contained in almost all bilateral air services agreements between nations.

8.5.4 As described in the statement of David Hawes of Qantas, Australia has eliminated legislative limits on foreign ownership of domestic airlines. This enabled Virgin Blue to establish itself as a domestic Australian air carrier, even though it was foreign owned and controlled. The statement of Sean Ford indicates (at paragraph 81) that in Australia and New Zealand “solely domestic airlines do not face any sector specific foreign investment requirements or restrictions.”

8.5.5 Australia and New Zealand are exceptions in this regard. Major markets such as the U.S., Canada, Japan, Brazil, China, etc., severely limit foreign ownership of airlines, thus making mergers across national frontiers impossible. The EU airlines that fly within the EU to be owned by nationals of any EU member state, but does not allow non-EU individuals or entities to own EU domiciled air carriers.

8.5.6 In addition to the foreign ownership restrictions in national law, similar provisions are found in almost all bilateral air services agreements between nations via the ‘substantial ownership and control’ provision in the treaties. Thus, even if national law were to be

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89 He goes on to note that “foreign investments in such airlines are, instead, dealt with under the generic overseas Investment Act processes administered by the Overseas Investment Commission.” Note that Qantas has been able to establish a New Zealand domestic airline.

90 A standard provision in a bilateral air service agreement is that a nation can only designate a carrier for service on an international route if the carrier is substantially owned and controlled by citizens of the nation making the designation. Thus, an Australian carrier that is not substantially owned and controlled by Australians could not be designated for service to Japan, the U.S., or most other nations. Similarly, Australia would not accept for service to Australia a carrier designated by Japan that is not Japanese owned and controlled.
reformed (as in Australia and New Zealand) to allow foreign ownership of air carriers, treaty provisions would prevent such airlines from flying outside the domestic market. This, too, has the effect of preventing mergers of airlines across cross borders.

8.5.7 It should be noted that this ‘substantial ownership and control’ provision was recommended by the International Civil Aviation Organisation (ICAO). However, in March 2003, ICAO has recommended to all nations that they change this clause. Specifically, they recommend that a new clause be put in place which simply requires that an air carrier designated by a nation for international service have its principal place of business in that nation. If implemented, this would allow, for example, a French owned air carrier based in the Netherlands to be acceptable to the United States for international air services between the U.S. and the Netherlands. There is only very limited implementation of the recommended ‘principal place of business’ clause in air service agreements.

8.5.8 Nevertheless, even if the ‘principal place of business’ clause were to be implemented, the bilateral agreement will continue to be a barrier to merger. This is because the treaties will still require each nation to have its own air carrier(s), although they need not be nationally owned.

8.6 Alliances when mergers are not possible

8.6.1 In sections 8.2 and 8.3, I described the economic forces acting on FSA air carriers encouraging them to merge. These including exploiting available economies of traffic density, and expanding the scope of their networks to better serve consumers.

8.6.2 We have seen mergers of air carriers (or consolidation through exit) in those national markets that had multiple air carriers: the U.S., Canada, the United Kingdom, France, Japan, and Australia.

8.6.3 There is no reason to expect that these forces of economies of traffic density and consumer preference for large network service end at national borders. As stated by Fan et al.91

“The same economic incentives for airline consolidation in domestic markets exist in the international arena.”

8.6.4 As described in Section 8.5, however, restrictions in government polices, laws and air services treaties prevent mergers of international air carriers across borders.

8.6.5 To deal with pressures to consolidate, carriers throughout the world have entered into a

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range of alliance agreements with air carriers in other nations.\textsuperscript{92} As stated by Stephen Shaw,\textsuperscript{93}

"Therefore, merger and take-over activity has been limited to situations where airlines in the same country (or in the case of the European Union, within the same trading block) have come together. In other cases in order to gain the benefits of network size, airlines have had to fall back on another expedient – that of the strategic alliance."\textsuperscript{94}

8.6.6 Thus airline alliances should be viewed as a means to achieve as many of the gains as possible of mergers. This includes both market benefits, i.e., satisfying demand from those consumers preferring service by carriers with large networks; and cost reduction benefits, including the ability to rationalise flight schedules so as to exploit or retain economies of traffic density. Until governments throughout the world negotiate new air services treaties which will accept the designation of air carriers which may be foreign owned, alliances are the only means to achieve the needed benefits and industry consolidation.

8.6.7 As shown in Appendix R, there are a variety of alliance types, ranging from simple code sharing to more integrated alliances.

8.6.8 These alliances are a means to obtain some of the gains which mergers would otherwise deliver. This includes expanded network coverage, and in some cases, cost savings.

8.6.9 However, achieving many of these benefits requires substantial commitments from air carriers. For example, an alliance to expand network coverage of air carriers only delivers benefits to consumers (and through their increased patronage, benefits to the carriers) when schedules are convenient. Achievement of convenience may require one or several carriers to substantially retim their schedules to provide connecting services. This is not a simple matter of changing the time of a flight or two. Because aircraft have multiple assignments each day, changing the timing of one flight may induce large scale changes throughout the system as sequential flights must change their times, requiring other flights at different times in the day and their connections to be re-timed, etc.

8.6.10 A cost economy, such as consolidating sales forces, puts a carrier at risk, in that if the alliance were to be dissolved it would require, among other things, recreating a sales team, rebuilding relationships with customers, etc.

\textsuperscript{92} Even within the large national market of the U.S., air carriers have entered into a range of alliances, such as that between Northwest and Continental.

\textsuperscript{93} Shaw (1999).

\textsuperscript{94} Page 88.
8.6.11 Thus, in order to realise some of the gains of mergers via an alliance, carriers must make substantial commitments and bear substantial risks.

8.7 Evidence on the effects of alliances

8.7.1 The review of literature in Section 4.5 indicated that limited empirical work has been done in this field. However, what has been done does not support an hypothesis that alliances create market power. Most of the evidence points to fare reductions, especially for passengers using connecting services.

8.7.2 Hannegan and Mulvey (1995) examined the impact of a number of international alliances on airlines and, to a lesser extent, consumers. The paper was summary of research carried out by the authors for the U.S. General Accounting Office. In general, the research found that the alliances improved connectivity of passengers, with greater choices of connecting services. Traffic increased on feeder routes. It also appeared to boost the revenues of the carriers in the alliance. The authors did not investigate the impact of alliances on airline costs, nor the impact on prices paid by consumers. The authors conclude that, in general, codesharing alliances have been an effective marketing strategy for the airlines, expanding their network scope and overcoming bilateral agreement restrictions. In regard to consumer benefits, the authors note that the alliances result in consumers having a far greater selection of one-stop routings to destinations, with improved connection times and fairly seamless interchange.

8.7.3 Burton and Hanlon (1995) noted:

“One of the main arguments advanced is that alliances increase competition through markets via hubs, and that they can be expected to have pro-competitive effects in narrowing price-cost margins on long-haul services, something that can be traded against any lessening of competition in short-haul hub to hub markets.”

8.7.4 Using a generic approach to assessing alliances in any industry, they describe the types of benefits enabled by airline alliances. These include:

- marketing joint services;
- economies of scale/scope, gains in route traffic density; and
- global reach.

96 Page 218.
97 Page 219.
8.7.5 The Australia Productivity Commission (1997) undertook regression analysis of the impact of codesharing on international routes to/from Australia using a panel data set from 1992 to 1996. Key findings are that code sharing alliances lead to a reduction in standard economy fares and has no impact on discount fares. The Commission stated:

*Overall, the quantitative analysis presented here suggests that the presence of code sharing on international routes to and from Australia is estimated to have led to a reduction in standard economy fares. There also appears to be a significant negative relationship between the proportion of code shared seats and the level of standard economy fares on that route. However, these two code sharing variables have an insignificant effect on discount fares. This result may point to the presence of tight profit margins in the discount fare market reflecting the already strong competition in this market segment. Indeed it is expected that airlines would reduce the price of economy fares rather than discount fares on the basis that it may encourage some substitution from discount to economy fares and serve to improve the profit margin on a route.*

8.7.6 Park and Zhang (2000) carried out analysis of international alliances, examining the price, traffic and consumer surplus impact of the following four transatlantic alliances:

- British Airways/US Air (1993);
- Delta/Sabena/Swissair (1992);
- Northwest/KLM (1992); and
- United Airlines/Lufthansa (1994).

8.7.7 Key findings included:

- In 3 out of the 4 alliances, traffic increased following the alliance on the affected routes.
- 2 of the 4 alliances conclusively resulted in fares reductions: a third alliance resulted in a 12% reduction in fares but the result was statistically weak. For the case where the analysis found increased fares, the result was statistically weak.
- 3 of the 4 alliances increased consumer surplus. Only the Delta/Sabena/Swissair alliance was estimated to have reduced consumer surplus. It is interesting to note that the latter two carriers entered bankruptcy.
8.7.8 Oum and Park (1997) surveyed 46 alliances among the world’s top 30 airlines. They note:

“We conclude that alliances among airlines are not a passing phenomenon but rather a permanent fixture of the industry because they not only create value[s] to customers, but also enhance profit opportunities for the partners. Therefore, strategic alliances among major carriers are likely to be strengthened in the future.”

8.7.9 Oum and Park also anticipated the emergence of the global airline alliances:

“Since alliances are a positive sum arrangement, and the gains from alliance[s] can be shared equitably among alliance partners as well as between consumers and airlines, it is a matter of time when competing global alliance networks will emerge.”

8.7.10 Oum (2001) undertook a study commissioned by the Canada Transportation Act Review Panel which examined the impact of global alliances on the air passenger market.

8.7.11 The analysis found that:

- participation in a major alliance increased an airline’s Total Factor Productivity by 4.9%;
- minor alliances increased productivity by 0.9%, though the result is not statistically significant;
- a major alliance reduced average airline prices by 5.5%;
- minor alliances reduced prices by 0.3%, but the result was not statistically significant.
- a major alliance increased profits by 1.4%; and
- a minor alliance had no statistically significant effect.

8.7.12 Oum went on to describe a theoretical model developed by Oum, Park and Zhang in 2000, which examined the effect of alliances on equilibrium market outcome. The model examined a three carrier market, where two carriers then form an alliance.

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99 Page 133.
100 Page 133.
101 More details can be found in Appendix K. His report was based, at least in part, on a review of other studies of the effects of alliances.
This analysis found that a *complementary* alliance (two carriers connecting their network) would result in greater overall output in all markets but with the output of the non-alliance carrier decreasing. The alliance partners also earn greater profits (and the non-alliance carrier less profits), and price would decrease on at least one of the complementary alliance routes. Overall, consumer surplus and economic welfare would likely increase. A *parallel* alliance (alliance carriers operating on the same route), would reduce total output on alliance routes (impact on non-alliance carrier output unknown). Price would likely increase and consumer surplus decrease.

Using the Oum findings, a key issue in the current proceedings will be to what extent the alliance between Qantas and Air New Zealand constitutes the joining of complementary routes. There is overlap on the nine trans-Tasman routes, and in some domestic New Zealand markets, but a large number of other routes the two carriers serve do not overlap. The two carriers have put forth evidence that there is a high degree of complementarity between their route systems, especially for selling combined Australia-New Zealand tourism services. Thus, the Alliance involves a high degree of complementarity of routes.

Simon Rene Bernardi comments on this in his 5 March 2004 statement. He points out (at paragraph 17) the greater frequency and quicker connections from which consumers will benefit. As well, he describes (beginning at paragraph 18) the ability to increase the number of visitors (by 50,000 per annum above natural market growth) to Australia and New Zealand.

The statement of Norman John Thompson further describes (beginning at paragraph 320) the increase in dual destination travel which the alliance will enable.

It is my opinion that the development of alliances by airlines, a phenomena observed throughout the world, is a natural response to pressures to consolidate in order to maintain or increase economies of traffic density and to provide consumers with the broad network coverage they seek.

While the literature on the effects of alliances is only starting to emerge, it is not consistent with an hypothesis that alliances lead to higher prices and reduced economic welfare. The limited evidence that does exist generally is supportive of benefits from alliances for both consumers and carriers.

**The KLM-Air France Alliance**

The scope of alliance development has been increasing, and greater and greater integration has been taking place. Regulatory authorities have been approving many of the requested alliances because of a) the benefits they produce for consumers and carriers, and b) the absence of evidence of the exercise of market power by alliances.
8.8.2 Recently, a new phase has emerged in alliance building which is moving increasingly toward merger. This has been driven by the need to extend network breadth and depth to avoid being overlapped by competing carriers, and to achieve this while reducing costs so as to compete against the onslaught of LCCs in short and medium haul markets. The ‘near-merger’ alliance between Air France and KLM is a recent example of this trend.

8.8.3 On 30 September 2003, KLM and Air France announced an intent to form a holding company which would own each of the two carriers. The transaction allows joint co-ordination of a wide array of functions. While each of the carriers have been partners in major global alliances, this transaction will allow greater cost savings and greater network development. A complicated governance structure will allow the greater efficiencies yet meet the letter of the foreign ownership restrictions in the bilateral air service agreements of France and the Netherlands.102

8.8.4 Reasons cited for the transaction include:103

- Jean-Cyril Spinetta, Chairman and CEO of Air France, said: "Capitalising on the two brands and on the complementary strengths of both companies, we should, within SkyTeam, be able to capture enhanced growth opportunities."

- Leo van Wijk, President and CEO of KLM said: "KLM has been pointing out the need for consolidation in light of the challenges facing our industry, and we have not made it a secret we are looking for a strong European partner. Through this innovative partnership with Air France and our subsequent expected participation in the SkyTeam Alliance, we are confident that we have secured a sustainable future for our company."

- The proposed transaction will strengthen the SkyTeam alliance, making it the second largest alliance in the world.

- Air France estimates that a link with KLM will save 450 million euros a year by cutting overlapping routes and jointly purchasing aircraft.

8.8.5 Air France is the 5th largest airline in the world, ranked by total revenues.104 It is the largest non-U.S. carrier. It would be ranked 4th globally if cargo carrier Federal Express is excluded from the ranking.

8.8.6 The combination of the two carriers would make it either the 2nd or 3rd largest airline, depending on whether cargo carrier Federal Express is included in the comparison.

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102 The transaction involves an exchange offer by Air France for all KLM securities.
104 Air France had 2002 total operating revenues of US$10.2 billion. KLM’s 2002 operating revenues were US$5.8 billion. Fourth ranked Delta Airlines had 2002 annual operating revenues of $12.4 billion.
8.8.7 There are some similarities between the KLM-Air France transaction and that between Qantas and Air New Zealand, although there are important differences as well.

8.8.8 The KLM-Air France transaction, like that between Qantas and Air New Zealand, is not an outright merger. Two separate air carriers will continue to exist. Each will have its own corporate overhead, its own fleet and employees, its own maintenance procedures and operating manuals, etc.

8.8.9 Unlike the Qantas-Air New Zealand case, the governance structure in the KLM-Air France transaction uses a holding company which will own both air carriers. However, the holding company will only be able to exercise 49% of the voting rights of KLM’s equity shares. The holding company will inter alia gain veto rights over KLM’s business plan and budgets and gain the right to veto the remuneration and appointment and to dismiss the senior KLM management. In the case of Qantas-Air New Zealand, each airline will continue with its own governance structure. Qantas will only gain two seats on the Air New Zealand board, and Air New Zealand will obtain one seat on the Qantas board. Neither carrier will control the other.

8.8.10 There is a similarity in that each of the two carriers are in different global alliances. Air France is a member of the SkyTeam alliance, while KLM is a member of the so called Wings Alliance. However, while the KLM-Air France transaction may lead to consolidation of two global alliances, this is unlikely to be the case for Qantas/Air New Zealand.

8.8.11 The European Commission evaluated the KLM-Air France transaction as if it were a merger. This was done even though even larger cost reduction benefits would likely have been possible if the carriers entered into outright merger of their operations.

8.8.12 In both cases, the route systems of the carriers are largely complementarity, with only limited overlap. The overlap in Qantas – Air New Zealand is on the trans-Tasman, some domestic New Zealand routes, and the Auckland-Los Angeles route. KLM and Air

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105 After three years, there is an option for the holding company to exercise all voting rights of KLM, but this will need to be conditional on changes to all of the Netherlands’s bilateral air services agreements to replace the ownership and control clause with the ICAO recommended ‘principle place of business’ clause, or some equivalent. Alternatively the European Union may replace all Netherlands air services agreements with new European Union air services agreements. Both of these seem unlikely to be achieved in full within three years.


107 The KLM-Northwest et al alliance has never officially called itself ‘Wings’, but the term is widely used throughout the industry, including by KLM in various presentations it makes.

108 It should be noted that Qantas flies beyond Los Angeles to New York, and this extension may be a complementary to Air New Zealand’s Los Angeles service.
France overlap on a modest number of routes between Amsterdam and the major cities in France (Paris, Nice, Marseilles, etc.).

8.8.13 There is important route complementarity in the KLM and Air France routes systems, such as serving different destinations in Africa and North America. In the case of Qantas and Air New Zealand there is great complementarity in a number of dimensions. Both serve Los Angeles but while Qantas flies on to New York, Air New Zealand operates to London. This route complementarity will allow exchange of traffic and the building of a greater market scope and presence at Los Angeles. In Asia, the two carriers serve some common destinations, but from different cities (providing great opportunity to build the dual destination market). There are also some cities served by one carrier, but not the other. While Qantas serves Bangkok, Air New Zealand does not (nor does it have a code sharing agreement in the market), providing an opportunity to offer a connecting service to a new destination from Auckland which would build Qantas’ traffic density on both the trans-Tasman route and the routes to Bangkok.

8.8.14 The geographic proximity of the hubs of KLM and Air France (395 kilometres) is much closer than that of Qantas-Air New Zealand (2158 kilometres). Thus the Commission considered the extent to which certain services, especially to Africa, might be viewed as overlapping versus complementary.

8.8.15 The European Commission approved the KLM-Air France transaction on 11 February 2004.

8.8.16 As part of their application to the Commission, the two airlines had agreed to an undertaking to provide slots to accommodate up to 31 additional flights per day on certain overlap routes. This is because both the Amsterdam and Paris airports are seriously slot constrained facilities, and it is difficult to obtain slots to enter the market at a minimum efficient scale.

8.8.17 There is an undertaking that KLM and Air France will not increase their frequency of service on certain overlap routes for a period of time. This is because on some routes they are the only operators, unlike the case in Australia/New Zealand where there are fifth freedom operators and LCC Pacific Blue on key trans-Tasman routes.

8.8.18 One element considered by the European Commission was whether this alliance could result in diminished competitiveness of the other global alliances. Some network competitors of KLM-Air France argued to the Commission that airlines increasingly compete on a network to network basis (or alliance to alliance). KLM-Air France acknowledged this as well, and indeed improving network scope was a key rationalisation for the transaction.

8.8.19 Nevertheless, the Commission maintained that the relevant market continued to be origin destination pairs, and rejected any alliance to alliance or network to network basis for
market definition. In their view, competition from other alliances was a factor to consider in assessing whether consumers would have competitive choice after the transaction, but alliances were not the relevant market per se. The Commission did not consider as relevant whether the transaction would result in alliance consolidation. What is relevant is the nature of competition on specific routes. The nature of specific agreements were considered, but only on a market by market basis.

8.8.20 The Commission considered impacts on air cargo markets. It found that in the case of KLM-Air France, competitors included combination carriers (i.e., passenger airlines carrying cargo in belly space or in dedicated air freighters), all-cargo carriers, and integrators. It also found "that customers of air cargo transport (freight forwarders, integrators and consolidators) are able to exert a considerable countervailing buying power vis à vis air cargo carriers on certain routes."109 Thus the Commission concluded that the proposed transaction would not strengthen any dominant position on the routes affected.

8.8.21 As already indicated, the Commission approved (decided not to oppose) the KLM-Air France transaction. Undertakings were largely confined to address the issue of facilitating access to scarce airports facilities and otherwise facilitating entry on affected routes.

8.8.22 It is my opinion that the pursuit by KLM and Air France of an alliance (which is approaching key characteristics of a merger) is a natural response to market forces to maintain or increase economies of traffic density and to provide consumers with the broad network coverage which they strongly prefer. Recognising the benefits to consumers and carriers, the European Commission did not oppose the Alliance. It is a response to the network overlap facing these two carriers.

8.8.23 The KLM – Air France alliance has relevance for the Alliance requested by Qantas and Air New Zealand. The latter two carriers are also responding to pressures for cost reductions (from LCCs and 5th freedom carriers offering low fares) and to expand network scope. The latter is a response both to emerging network overlap from other well financed carriers and to consumer preference for service from carriers with large, well integrated networks. While the European Commission imposed some undertakings on Air France and KLM for a short period, these were due to the severe capacity problems at the European airports, and are not relevant to the case of Australia and New Zealand.110

8.9 Conclusions Regarding the Economics of Mergers and Alliances

8.9.1 This section discussed mergers and alliances in the airline industry. The two primary

109 P. 31.
110I note that the airports in both Paris and Amsterdam have not been privatised.
economic characteristics which favour large air carriers were identified:

- economies of traffic density; and
- consumer preference for services from carriers with large networks.

Thus, there are both supply side and demand side forces favouring large air carriers.

8.9.2 The existence of economies of traffic density strongly favours any given route being served by a very small number of air carriers.

8.9.3 The consumer preference for services from carriers with large networks, combined with the effect of economies of traffic density, results in few sustainable carriers in a market.

8.9.4 The need for consolidation of the FSAs is a simple matter of mathematics. As the LCCs grow, the FSAs will be forced into a smaller market share. To prevent loss of economies of traffic density (which would raise the unit costs of the FSAs), they need to consolidate to maintain existing economies.

8.9.5 There have been mergers of both FSAs and LCCs.

8.9.6 In those countries that had multiple FSAs, almost every single major FSA has been involved in a merger. This evidence indicates that the pressures for airline consolidation are observed throughout the world. Every major market that had multiple carriers has seen some degree of merger activity. Airline mergers have taken place in the U.S., Canada, Australia, France, the U.K. and Japan.

8.9.7 Mergers of international airlines take place only within a single country. This is due to foreign ownership restrictions imposed by governments.

8.9.8 To deal with pressures to consolidate, carriers throughout the world have entered into a range of alliance agreements with air carriers in other nations.

8.9.9 While the literature on the effects of alliances is only starting to emerge, it is not consistent with an hypothesis that alliances lead to higher prices and reduced economic welfare. The limited evidence that does exist generally is supportive of benefits from alliances for both consumers and carriers.

8.9.10 It is not surprising that Qantas and Air New Zealand seek to form an Alliance. Carriers all over the world are responding to the twin forces of maintaining or expanding economies of traffic density and other cost savings from consolidation, as well as strong consumer preference for service by large network air carriers. The proposed Alliance is a natural step in the evolution of the FSAs toward higher concentration as LCCs rapidly gain market share, and as global reach carrier networks develop.
9.0 FSA Subsidiaries and Associated Carriers

9.1 Introduction

9.1.1 The LCCs are exerting enormous pressures on FSAs. Not only are their unit costs lower, their pricing practices have weakened the revenue base of the FSAs. This requires a substantive response by the FSAs if they are to survive.

9.1.2 As we have seen, some FSAs have been compelled to change their pricing practices to be more similar to those of the LCCs. While this has mitigated the loss of traffic it may not address the loss of profitability. The statement of Michael Anthony Swiatek (at paragraph 191) indicates that total route revenues may remain the same after the entry of an LCC with lower fares. While total traffic has increased, the lower fares mitigate or eliminate any growth in revenues.

9.1.3 Thus, merely matching the pricing practices of an LCC may not address the loss of profits by an FSA facing competition from an LCC.

9.1.4 The FSAs must reduce their cost base. Some carriers have sought to achieve cost decreases in their mainline operations.

9.1.5 Other carriers have attempted to create new, subsidiary airlines (or a new brand within an FSA) as means of reducing the cost base, at least on some routes and flights. The cost reduction via a new air carrier can be multi-dimensional. First, the new carrier may have lower factor costs, such as lower wage rates. Second, the new carrier may have less restrictive work rules, allowing cost reductions via higher productivity. Third, the new carrier can be positioned to lower consumer service expectations (e.g., no lounge access, no meals), allowing cost reduction via the removal of some service elements.

9.1.6 This chapter looks at the use of subsidiary air carriers and other types of ‘associated air carriers’ such as the use of a distinct brand within an FSA for certain lower cost and low fare services. The chapter looks at the record on the use of such carriers, as well as their role in restructuring FSA businesses to meet the new environment in which they must compete.

9.2 The need for cost reduction

9.2.1 As has been described already, LCCs operate with lower unit costs than FSAs.
9.2.2 The attached diagram compares the unit costs of the U.S. carriers as of the end of 2003.\footnote{These cost comparisons do not correct for stage length or any other operational factors, but nevertheless support the observation that U.S. LCCs continue to enjoy substantial cost advantages.}

**Figure 7: Comparison of FSA and LCC seat costs in the U.S., 2003**

9.2.3 There is a clear line of demarcation between the unit seat mile costs of the FSAs and those of the LCCs. All of the U.S. FSAs had seat mile costs of 10 cents or higher. In contrast, the highest LCC, Frontier, had seats costs only slightly above 8 cents, with most in the range of 6 to 8 cents per seat mile. This simple comparison indicates that the FSAs’ unit costs are roughly 25-40% above that of the LCCs.

9.2.4 Note that during 2003, the U.S. FSAs underwent dramatic restructuring. Two major carriers, US Airways and United, restructured under protection from bankruptcy. The others restructured to varying degrees without formally entering bankruptcy protection. Thus the above cost comparisons between the FSAs and LCCs, already embody a large portion of the gains the FSAs may have been able to achieve. The remaining cost gap appears to be 25% or higher.
9.2.5 Further, many of the LCCs continue to reduce their unit costs, as was described in Section 3.4. The FSA effort at cost reduction has a moving target as the LCCs reduce costs.

9.2.6 While U.S. and other FSAs have been able to reduce their unit costs somewhat, there is still a substantial cost gap with the LCCs. The New York Times, using data from LECG,\textsuperscript{112} reported that while American Airlines has been able to reduce its cost per seat mile to 10.5 cents per seat mile, this is still 77\% higher than JetBlue’s 5.9 cents per seat mile.\textsuperscript{113}

9.2.7 A cost gap is also observed in Australia. A report by UBS Warburg estimated Virgin Blue’s cost per seat mile as 8.4 cents versus a cost per seat mile for Qantas’ domestic services of 10.9 cents.\textsuperscript{114} This is roughly a 30\% cost gap.

9.3 \textbf{Means of reducing FSA costs}

9.3.1 FSAs have sought means to achieve quantum improvements in their unit costs. Means that have been used include:

- seeking productivity gains within existing operations;
- seeking reduction in factor costs, such as via reduced wage rates;
- creating new airlines as subsidiaries of an FSA, so as to start anew; or
- creating new operations within an existing FSA which are separately branded and where costs are reduced.

9.3.2 While the first two have been important elements, they have not yet demonstrated an ability to obtain the magnitude of reduction in unit costs to be able to fully compete with LCCs.

9.3.3 Thus, a number of carriers have created either new subsidiary airlines or new brands within an FSA to attempt to achieve cost reductions.\textsuperscript{115} Either of these formats offers potential to reduce costs by one or more of the following:

\textsuperscript{112} Formerly “Law & Economics Consulting Group.”
\textsuperscript{115} Shuttle by United and Air Canada’s Tango are examples of brands. They were not created as separate subsidiaries. In both of these cases, trade unions granted some productivity concessions to facilitate the success of the brands.
• Reducing service levels, such as eliminating free meal service. Some view that FSA customers have locked-in service expectations. Only by using a separate brand will consumers be willing to accept a reduced service level.116

• Increasing revenues through methods such as selling onboard meals. This has been an important means by which LCCs have been able to keep down costs, and hence base air fares. The base air fare entitles the passenger to few services other than basic transportation. If the LCC offers some service enhancements, such as on-board meals or lounge access, the passenger pays a separate fee for these services. In some cases, the extra services may be able to generate a net profit for the carrier. In any event, they are a vehicle by which some services can be provided to those passenger who value them, although at a fee which fully covers cost.

• Increasing seating density to allow the potential for more seats to be sold on a flight.117

• Operating direct point to point services, which are generally cheaper per seat than connecting services. Direct services are less costly due both to reduced flying time and the cost savings associated with eliminating connections.118

• Achieving work rule concessions and/or wage reductions by hiring new labour with higher productivity collective agreements (or no collective agreements). In some cases (e.g., Shuttle by United, Air Canada Zip), existing airline employees have been willing to accommodate higher productivity within existing collective agreements.

• Operating single aircraft types and realising the associated cost reductions. A single aircraft type enables significant economies in staffing, spare parts inventories, training costs, etc. It also increases operational flexibility; for example, any pilot can fill in for any flight in the system.

• Other cost saving have been identified in the statements of Ralph James Norris,119 and Paul Edwards.120

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116 A separate brand also aids in preserving the high quality image needed to compete in long haul services, where a larger number of customers value the higher levels of service.

117 Note that simply increasing seating density by itself does not necessarily lead to increased revenue. If the extra seats cannot be sold, there will be no revenue increase. As well, in order to sell the extra seats, it may be necessary to sell the incremental seats at a discount, reducing yields.

118 Direct services reduce costs in other ways as well, such as eliminating costs associated with mis-connected baggage, interrupted trips, etc.

119 E.g., at paragraphs 56 and 71ff.

120 E.g., at paragraph 52ff.
9.4 FSA use of subsidiaries and separate brands

9.4.1 A number of carriers have set up, at one time or another, either a subsidiary carrier or a separately branded operation offering low fares. Appendix S provides a list of some of the efforts.

9.4.2 As can be seen, many major carriers have experimented with subsidiaries and separate brands, including United, Delta, Continental, Air Canada, Air New Zealand, Qantas, British Airways, KLM and British Midland, among others.

9.4.3 Not all major FSAs have used subsidiaries and/or brands. United, Northwest and Air France are major examples.

9.5 The limited success record

9.5.1 While the use of subsidiary airlines and other types of associated operations is often considered a recent phenomenon, there have been earlier episodes, as shown in Appendix S. Texas Air Corporation was a holding company that at one time controlled a number of U.S. airlines, including Continental (the surviving company), Eastern (bankrupt and liquidated), Texas Air (merged into Continental), New York Air (sold to Trump, resold to US Airways), People Express (merged into Continental), and Frontier (merged into Continental).\(^{121}\)

9.5.2 Notable in the Texas Air family is New York Air, which was a subsidiary airline created in 1980 specifically to compete against Eastern Airline’s successful east coast shuttle (New York – Washington DC, and New York – Boston) and in other markets.

9.5.3 New York Air was sold in 1987 and became Trump Shuttle. In 1989, Trump Shuttle began to operate as US Airways Shuttle. US Airways was originally a minority investor, but eventually it became the sole owner.

9.5.4 The record on subsidiary carriers has generally not been favourable. A number of U.S. based experiments with this format in the late 1990s were all terminated. British Airways experimented with a subsidiary to compete with low cost carriers EasyJet and Ryanair, but sold the operation to management, who later sold it to EasyJet. KLM’s Buzz was similarly targeted to compete with the LCCs, but it too ended up being absorbed by an LCC (Ryanair).

9.5.5 Some carriers are making second attempts at establishing subsidiaries to compete with

\(^{121}\) The current U.S. LCC carrier named Frontier is not the Frontier that was merged into Continental.
the LCCs. Air Canada, United and Delta all have new subsidiaries or brands operating. Qantas and Singapore are about to launch their own initiatives. The renewed interest reflects the considerable pressure LCCs are exerting on FSAs, the inability to fully restructure their mainline operations to meet the cost levels of the LCCs, and their need to find a means to substantially reduce cost and reposition at least a portion of their services to better survive the market pressure.

9.5.6 Not all carriers have pursued the subsidiary/brand strategy. American Airlines considered such an option in the early 1980s, but rejected it. Its preference was to reduce costs through internal growth and restructuring of the mainline operation. American introduced a controversial approach adopting a 'B pay scale.' Under this scheme, American reached agreement with its pilots that new hires would be paid a lower wage rate than existing pilots. This was intended to reduce costs of new services and improve the ability of the carrier to compete via growth. It was viewed as having the advantage of not incurring the costs of setting up a subsidiary, carrying its own corporate overheads, diluting brand awareness, etc. This two pay scale strategy was short lived, however. The disparity in pay for equal work was highly controversial and eventually the scheme was withdrawn and a single pay scale established.

9.5.7 Subsidiary carriers or specially branded operations within an FSA have also been used as incubators for new ideas to reduce costs or to serve customers in different ways. As well, they may play the role of exemplars to the FSA workforce. The success of a more efficient subsidiary operation may convince organised labour to make concessions to the parent FSA, either due to the growth associated with more efficient operations or because the subsidiary acts as a threat – it could grow and gradually replace mainline operations unless concessions are made.

9.5.8 However, the record here is not all positive. British Airways discovered that after creating a subsidiary GO, it faced greater challenges in convincing organised labour of the need for efficiencies. The view of labour was that the subsidiary would be the low cost response and the mainline would focus on higher yielding markets – which they viewed as not requiring cost reductions. This was the primary reason for BA selling off GO.

9.5.9 The use of subsidiary carriers faces two challenges to the achievement of success.

9.5.10 One mission of these carriers is to penetrate new markets, often the markets where LCCs have been successful. This was the original plan for Shuttle by United. However, the challenge United faced was that these markets are difficult to penetrate. A highly successful LCC on a route, such as Southwest, Ryanair or WestJet, would have a strong reputation for always being the low cost carrier. It was often discovered that if the

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122 In some cases these are somewhat restructured or repositioned versions of an earlier effort. Delta Express became Delta's Song.
subsidiary of an FSA advertised low fares, many consumers would automatically call the 
LCC, simply on the faith that the LCC would have the lowest price. Shuttle by United 
quickly withdrew from the Southwest markets in California (generally using secondary 
cities in a region) and redeployed its capacity to replace United’s mainline services on the 
West Coast with a somewhat reduced operating cost.

9.5.11 The second challenge is the impact of the subsidiary capacity on the mainline carrier’s 
revenues when the subsidiary (or brand) operates against (or with) the mainline carrier on 
the same route. The subsidiary is likely to divert revenue from the mainline carrier, an 
effect frequently referred to within the industry as cannibalisation. Operating both the 
mainline carrier and a subsidiary/brand makes the economics of the subsidiary complex to 
evaluate. The subsidiary hopefully stimulates the market and diverts revenue from other 
carriers (FSAs and/or LCCs) on the route. However, the evaluation should recognise the 
diversion of revenues from the mainline carrier.

9.5.12 Cases where the subsidiary completely replaces an FSA are easier to evaluate. This has 
been the case with Air New Zealand’s ‘Express’ products. As well, where the subsidiary 
provides services on previously unserved routes, evaluation is more straightforward. Air 
New Zealand’s Freedom Air is an example.

9.5.13 There are also cost accounting issues which arise. Specifically, what price does the 
subsidiary pay for services from the parent? Even where arms length transactions take 
place there can be subtleties. Aircraft assigned to the subsidiary may have market values 
higher than the value carried on the books of the FSA.

9.5.14 Finally, there is the issue of brand dilution. Use of a separate brand may weaken retention 
of a brand identity.

9.6 Air New Zealand’s Freedom Air

9.6.1 There are some modest successes, however. Air New Zealand’s Freedom operation has 
survived the test of time.

9.6.2 The statement of Ralph James Norris describes (beginning at paragraph 78) some of the 
key elements of Freedom Air’s operating model. These include:

- all of Freedom’s routes are point to point operations;

- there is no connectivity from a Freedom route to the rest of Air New Zealand’s network; and

- there is no connectivity from a Freedom route to other airlines.
All of these characteristics allow Freedom to avoid the substantial costs of network connectivity, interrupted trip expenses, mis-connected baggage, etc.

9.6.3 The scope of Freedom’s operations are quite limited. Most routes are in secondary markets not served by Air New Zealand, such as Palmerston North to Melbourne. Air New Zealand only serves this route via a connection. The routes where both Freedom and Air New Zealand fly non-stop are to Brisbane, and Freedom’s service frequency and capacity is limited so as to limit any erosion of Air New Zealand’s mainline revenues, which might have occurred if Freedom operated on the mainline routes of Air New Zealand.

9.7 Qantas’ JetStar

9.7.1 It may be useful to examine Qantas’ JetStar subsidiary in light of the comments in Section 9.5 on the limited success of subsidiary/brands of FSAs.

9.7.2 A number of key differences exist between JetStar and the typical FSA subsidiary operation. These differences suggest that of all the recent FSA subsidiaries, JetStar may have one of the best opportunities for success. The following table contrasts the JetStar business model with that of the typical FSA subsidiary/brand airline operation.

<table>
<thead>
<tr>
<th></th>
<th>Typical FSA subsidiary</th>
<th>JetStar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work force</td>
<td>Typically is the same unionised labour pool as the FSA, although with some work rule concession.</td>
<td>Different work force, hired de novo.</td>
</tr>
<tr>
<td>Employee attitudes and customer service orientation</td>
<td>As the workforce is the same, the same attitudes toward customers are present.</td>
<td>Due to de novo work force, potential exists for developing the type of culture present at LCCs.</td>
</tr>
<tr>
<td>Aircraft choice</td>
<td>Single aircraft type, but from the fleet of the mainline carrier.</td>
<td>Single aircraft type and different from those used by mainline. (Initially 717s but later A320 series – both not operated by Qantas).</td>
</tr>
<tr>
<td>Maintenance costs</td>
<td>Done by the mainline carrier at mainline rates.</td>
<td>JetStar will have own maintenance work force and is free to contract out any work to achieve the lowest possible cost meeting safety standards.</td>
</tr>
</tbody>
</table>
9.7.3 The success of JetStar is not assured, of course, but it has been able to step much further beyond operating parameters typically experienced by other subsidiaries of FSAs.

9.8 Conclusions

9.8.1 Overall, the track record of low fare subsidiaries has been weak at best, with credit being given to very few efforts (such as Air New Zealand’s Freedom operation and the potential for JetStar). A colder interpretation of the record is that most of these efforts have amounted to failed strategies. While accounting profits for the subsidiary or brand may have been positive, in a large number of cases it was at the expense of diluting the mainline carrier’s yields. Further, some analysts consider that these operations do not contribute to network strengthening, a core strategic objective of any FSA.

9.8.2 The success record of subsidiary air carriers of FSAs has been limited at best. Where success has been achieved to date, it has largely been confined to niche markets, such as Air New Zealand’s Freedom operation. There has been success, largely based in Europe, with long haul tourism charter subsidiaries.

9.8.3 The development of JetStar and Tasman Express may be necessary steps to deal with
LCC encroachment with or without the alliance. However, they are only part of the solution to the revenue erosion (from LCCs and 5th freedom carriers) and network envelopment challenges the Applicants face. JetStar and New Zealand/Tasman Express:

- will not create a basis for launching new long haul international routes to counter network overlap by stronger air carriers.
- will not enhance the network connectivity to the degree needed to obtain the dual market destination and other tourism benefits of the Alliance.
- will not allow the considerable capacity cost savings benefits on the trans-Tasman.
- will not allow capacity to be redeployed to improve the schedule spread, which would benefit to consumers, as resources will still be needed to build or maintain city presence.

9.8.4 The low cost subsidiaries of the Applicants are important developments, and address part of the challenges they face. But they do not have the capability of addressing the other serious challenges nor of delivering the wider range of benefits to consumers, the carriers, and Australia.
10.0 Network Envelopment and 5th Freedom Services

10.1 Introduction

10.1.1 The Applicants have put forth the concept of network envelopment. Here I discuss this concept and its importance for the future revenue base of Qantas and Air New Zealand.

10.1.2 I also discuss the concept of the 5th freedom operations to/from/between Australia and New Zealand. These operations have unique, low cost economics and can exert strong downward pressures on prices on routes. While 5th freedom operations are not found everywhere on the globe, the trans-Tasman market is ideally suited for such operations for a number of carriers. As well, open skies agreements recently entered into by the U.S., New Zealand and Australia are creating new opportunities for 5th freedom operations beyond New Zealand and beyond Australia by emerging global network carriers, such as Emirates.

10.1.3 There is an important linkage between network envelopment and 5th freedom operations. The latter is the means by which Emirates, Singapore and other carriers can increase the degree and scope of network overlap of Qantas and/or Air New Zealand. 5th freedom services, recently enabled by governments are the means by which certain geographically favoured carriers can extend their networks, overlap their rivals and emerge as truly global network carriers.

10.1.4 Of key importance to this section of my statement is that while FSAs collectively are facing the need for consolidation due to the incursion of LCCs into their market shares, they also face pressures from other FSAs. Specifically Qantas and Air New Zealand are facing increasing network envelopment pressures from carriers such as Singapore and Emirates attempting to achieve global scope of their own networks, and increased economies of traffic density (by increasing traffic by offering the highest level of service to long haul consumers). The proposed alliance between Qantas and Air New Zealand is the one opportunity these carriers have to develop a strategic advantage with which to compete with global reach carriers.

10.2 Network Envelopment

10.2.1 One of the key strategic objectives of FSAs is the development of comprehensive service networks.
10.2.2 Oum, Taylor and Zhang state the following:\textsuperscript{123}

Most consumers prefer to fly with a large airline which has an extensive international network. Reasons for this preference include: minimising the consumers' own cost of route planning since virtually all destinations are served; receiving higher quality service (more frequent flights, on-line connections, co-ordinated schedules, and so forth); and membership in more attractive frequent flyer programs.

... a global airline network is defined as an airline network capable of providing service to most of the large and medium-sized cities around the world, channel that traffic onto its long haul routes, and distribute it through collection systems on other continents.

10.2.3 Because an important segment of airline consumers seek service from carriers offering large networks, FSAs have been seeking to increase their network scope. There are a number of strategies for doing this, although each has its own limitations. These include:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Limitation</th>
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<tbody>
<tr>
<td>Expansion</td>
<td>Due to limitation on operations within and beyond foreign markets, carriers from smaller nations can be limited in the degree to which they can develop global networks. Only a limited number of FSAs are generating the cash needed (or have access to new cash)</td>
</tr>
</tbody>
</table>

\textsuperscript{123} Oum, Taylor and Zhang (1995), pp. 4-5.
10.2.4 A carrier that can offer a consumer services to a large number of the destinations they travel to over a period of time will increase its market share for the reasons articulated by Oum, above.

10.2.5 Network envelopment is a strategy by which an FSA overlaps the routes of a competitor to a high degree.

10.2.6 Network envelopment creates a strong loyalty to the carrier with the more extensive network among some consumers. As was shown in Chapter 8, consumers prefer service from large network carriers, even for some trips which do not require connections.125

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124 As indicated in Section 8, even the new "principal place of business" clause suggested for bilateral air services agreements will not enable mergers across national frontiers.

125 Consider the case of a passenger travelling on a simple non-stop itinerary, but for whom the ability to reach the destination is paramount. The passenger may have booked a non-stop flight, perhaps the last in the day, but it is cancelled for mechanical or another reason. If the ticket was with a point to point carrier, the traveller will not reach the ultimate destination within the required time. On the other hand, a trip booked on a carrier with an extensive network will likely have indirect means to reach the destination via a number of alternative connection points. This service redundancy is important for a wide range of travellers, including business travellers, those attending sporting events, families gathering for a wedding, funeral or other event, etc.
Network extent and redundancy is especially highly valued by high frequency travellers. Not only do these travellers fly frequently, they have an important revenue impact on an FSA since they typically will book late and be willing to pay some premium for last minute availability and for service amenities.

10.2.7 Network scope is especially important for long haul services, as these are the services where the value of network connectivity is likely to be highest. Network connectivity on short haul routes, while of importance to some travellers, is of less importance overall, as a greater degree of the market is travelling point to point on non-stop services.

10.2.8 Factors which are important in the envelopment of a carrier’s network include the following:

- The number of destinations served non-stop.
- The importance of the destinations served non-stop and via one stop connections.
- The frequency of service to non-stop and connecting destinations.
- The redundancy of service offerings, allowing alternate means of reaching a destination when service is disrupted, overbooked, etc.
- The quality of service offered, especially for long haul routes. This includes the type of seat available, in-flight amenities such as video and other entertainment, meal service quality, lounges at departure, connecting and arrival points, etc.
- The aircraft deployed on the route. Frequent travellers generally prefer newer aircraft types and recent production dates. Wide body service is preferred to narrow body.
- The frequent flyer program. Dimensions of importance include ease of earning points, network scope for earning points, network scope for using points, availability of seats at the desired time of reward travel, upgrade opportunities, etc.

10.2.9 Most of these dimensions require significant investments. With aircraft utilisation typically in the range of 10-11 hours per day, operating a double daily frequency on a route requiring 10 hours of flying time, requires four aircraft. With long haul wide body aircraft prices in the range of US$125-200 million, the investment required is $500-800 million, simply for the aircraft.

10.2.10 Ralph James Norris commented on the challenge to Air New Zealand from network envelopment:

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126 Paragraphs 81-83.
“In 2002, Air New Zealand needed to take steps to keep its international long haul product offering competitive against larger carriers which were operating on a number of routes which overlapped with the international long haul routes and international short haul routes on which Air NZ was operating. These carriers included Singapore Airlines, Thai International Airlines, Cathay Pacific and Qantas

...These larger carriers had:

(a) greater financial resources than Air NZ;

(b) larger networks which offered greater depth (more frequency of services) and greater breadth (more destinations and connections) than Air NZ;

(c) larger and better fleets than Air NZ; and

(d) significantly larger core markets.

Such carriers had the potential to capture Air NZ’s high value traffic because their networks partially enveloped Air NZ’s network and offered the customer a better and more complete service to meet their travel needs because it allowed them more options to reach a larger number of destinations. By high value traffic, I mean the passengers who are willing to pay a higher airfare in order to gain various advantages such as the ability to change times and dates of travel at short notice; gain access to airport lounges; and earn frequent flyer points. A large proportion of the high value traffic comprises business travellers”.

10.2.11 In his statement, Paul Richard Edwards identified (beginning at paragraph 60) five significant factors which threaten Qantas’s ability to maintain a competitive position in the face of international competition. These include:

- “Government owned or subsidised airlines.”127
  As indicated, the long haul business passenger prefers an extensive network served with high frequency in new aircraft with a high degree of on-the-ground and in-flight amenities. Government subsidy, or indirect subsidy (e.g., via explicit or implicit loan guarantees, reducing financing costs) create an advantage in developing enveloping networks.

- “‘End of route' destinations.”128
  Australia and New Zealand are geographically located as end of route destinations, virtually eliminating their ability to use their home bases as connection points to a large

127 At 61.
128 At 62.
range of destinations. Travel to a wide range of destinations in Europe via Singapore is fully competitive with Qantas' direct services. Emirates offers service from Sydney to London which is only 300 nautical miles longer, an acceptable diversion for this length of route. On the other hand, travel to the U.S. from Singapore via Sydney or Auckland is not an attractive alternative, as it is more than 3300 nautical miles longer. Thus, Qantas and Air New Zealand are under greater threat of network envelopment, with limited or no ability to respond with envelopment of the networks of other carriers.

- “Competing in the international arena against airlines of far greater size and hence far greater scope for economies of scale”.\(^{129}\) Emirates, for example, is the largest non-European carrier operating to/from Europe. It has 43 Airbus A380 passenger aircraft on order, indicating its scope for service enhancement and expansion.

- “High costs.”\(^{130}\) Edwards notes that consolidation is difficult, if not impossible to achieve due to foreign ownership limitations. This limits Qantas' ability to achieve new economies of traffic density or to maintain existing economies if it loses market share to enveloping air carriers.

- "international tourists regard travel to this area as travel to a combined Australia/New Zealand area."\(^{131}\) Qantas needs to distinguish itself from competing network carriers by being able to offer a comprehensive network over the combined Australia/New Zealand region.

10.2.12 These statements articulate the challenge to Qantas and Air New Zealand from enveloping network carriers who are able to offer superior service to a wider range of destinations. The challenges to the two carriers are due in part to geography, but also to access to financial capital, especially in the case of Air New Zealand.

10.2.13 The one important opportunity to gain a strategic advantage is in being able to offer a unique network dimension – a comprehensive network of the combined Australia/New Zealand tourism market. Achieving this competitive advantage is of great public benefit, as it would allow Qantas and Air New Zealand to better compete against alternative tourism destinations. Even a small shift of the massive global tourism market to a combined and enhanced Australia/New Zealand experience will benefit many businesses and wage earners in the two nations.

\(^{129}\) At 63.

\(^{130}\) At 64.

\(^{131}\) At 65.
10.3 The global reach carriers: Singapore and Emirates

10.3.1 Being based at end-of-route destinations, Qantas and Air New Zealand face network envelopment from a number of carriers. Carriers such as Cathay Pacific, United, Thai International Airlines, and Japan Airlines, all serve Australia and/or New Zealand as end point destinations, but can also provide connections to a wide range of beyond destinations (and origination points) via one stop service at their hubs.

10.3.2 However, two enveloping carriers are of special importance to Qantas and Air New Zealand. These are Singapore and Emirates. These two carriers are of special importance due to:

- their access to massive amounts of financial capital to finance expansion;
- their strategically located hubs which can serve much of the long haul travel to/from Australia/New Zealand; and
- their pursuit of strategies to expand beyond their home markets. These carriers generate high cash flows from their existing home based operations. As expansion opportunities at the home base diminish due to saturation of the market, the two carriers are investing in new operations beyond their homes.

10.3.3 These two carriers appear to be each pursuing new strategic objectives, which I refer to as becoming global reach carriers. This is a new stage in network building. Previously, building truly global networks was constrained by restrictive bilateral air services agreements. Recent changes have enabled the opportunity for some carriers to grow beyond their home markets. These include the U.S. style of open skies bilateral air services treaty, and the emergence of a small number of multilateral open skies treaties.

10.4 Enabling the Global Reach Carrier

10.4.1 I explain the global reach opportunity further.

10.4.2 During the 1980s and later, the growth of network connectivity was achieved in a number of countries through mergers of national carriers. In Australia, the merger of Qantas and Australian greatly enhanced the network scope of both carriers. In Canada, CP Air and the regionals merged to form Canadian, which in turn was merged into Air Canada. In the U.S. there was a series of mergers to create larger networks, beginning with Pan Am (which only offered overseas services during the regulated era) and National (a domestic
only carrier). United (a North America only carrier prior to deregulation)\textsuperscript{132} acquired the Pacific route system of Pan Am expanding its network scope dramatically.

10.4.3 These domestic mergers greatly improved the network scope of the carriers and produced great benefits for consumers from increased on-line services to their ultimate destinations. However, the gains in network scope were limited to what could be achieved with airlines within the national market.

10.4.4 The 1990s saw experimentation with alliances of various types. These alliances were typically between airlines of different nations. Via code sharing, preferential interline pricing agreements and other measures, consumers could be offered a network of greater scope and connectivity.

10.4.5 Alliance building progressed to result in the development of the large global alliances, such as oneWorld, Star and SkyTeam. These alliances are virtual extensions of a carrier’s network by being able to sell the services of other air carriers in a much more integrated manner than simpler code sharing or interline pricing arrangements. The alliances facilitated reworking of flights schedules and routes on a global scale, enhancing connections via co-ordinated flight times.\textsuperscript{133} An increasing number of alliances have been granted anti-trust immunity in order to achieve greater gains.\textsuperscript{134}

10.4.6 The alliances are still collections of separate carriers. The global reach carrier is a logical next step in network building. Just as the U.S. FSAs are able to operate multiple hubs in their domestic market, the global reach carrier seeks to grow its network scope by internal or other investment in new hubs. As the investment is fully controlled by the global reach carrier, it may be able to obtain a greater degree of benefits.

10.4.7 The global reach carrier attempts to operate, on its own, to a larger and larger market. It does this in part by developing secondary hubs where it can offer connections.

\textsuperscript{132} United’s services were confined by the regulator to domestic U.S. routes and a small number of short haul routes to Canada.

\textsuperscript{133} Prior to the global alliances, two carriers based on different continents would enter into code sharing and other agreements to expand the scope of service offerings a carrier could make. However, the hub operations on each continent were separate and not co-ordinated, often resulting in long connection times. In a number of case, the global alliances were able to get the alliance members to retime their banks of flights to better match with the ‘pipeline’ routes connecting the hubs. Typically this would require re-timing almost all the flights at the respective hubs. This in turn displaced aircraft flying domestic services requiring schedule changes at secondary hubs and throughout the whole system.

\textsuperscript{134} Note that typically immunity is granted for pairs of carriers in an alliance, and not all possible pairs of carriers have requested immunity. In the Star Alliance, for example, Air Canada and United received anti-trust immunity from the U.S. and Canadian competition authorities, United received authority from the U.S. and European Union for its alliance with Lufthansa and SAS. Air Canada and Lufthansa never requested immunity for their common routes.
10.4.8 The advent of the global reach carriers is due to a few key developments.

10.4.9 First is the reduction in entry barriers, especially by U.S. type open skies policies. U.S. open skies bilateral agreements grant carriers unlimited freedom to operate not only between the two countries party to the treaty, but also beyond each other’s territory. The increasing number of such open skies agreements creates the opportunity, for the first time, for carriers to begin to develop major operations (even hubs) outside their own territory. Of special importance is that these open skies agreements allow for unlimited 5th freedom opportunities. For the first time, well endowed FSAs can reach beyond their home markets and begin to build operations further afield.

10.4.10 Second, is the emergence of a small number of multilateral open skies agreements. In this region, the key agreement is the Multilateral Agreement on the Liberalisation of International Air Transport (MALIAT). This is an open skies agreement granting unlimited 3rd/4th and 5th freedom rights to all signatories. Countries which have signed the agreement thus far include the U.S., New Zealand, Singapore, Samoa, Brunei, Chile, Peru and Tonga.

10.4.11 Third has been the emergence of a small number of FSA carriers with access to large volumes of cash. Two carriers are particularly notable in this regard: Singapore and Emirates.

10.4.12 In the case of Singapore Airlines, a number of analysts consider that the carrier is generating greater amounts of cash than it could invest in its single hub. As a result, it made investments in Virgin Atlantic (December 1999) and other carriers (e.g., Silk Air). However, now with new open skies freedoms, it may be able to invest in developing new routes beyond its current hub.

10.4.13 In the case of Emirates, for various reasons the carrier has access to large amounts of cash. It has 43 of the new A-380 super wide body passenger aircraft on order, almost as many as all other carriers in the world combined. This is in addition to other aircraft it has on order, such as the ultra long range A340-500. In its 2003 Annual Report, the carrier stated

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135 The beyond authorities can also include intermediate points. For example, Emirates is allowed to operate from the UAE to the U.S. via intermediate points, with rights to carry traffic from the intermediate points to the U.S. (and vice versa for U.S. carriers to the UAE).

136 The U.S. now lists 59 open skies agreements. Source: U.S. DOT website, Office of the Assistant Secretary for Aviation and International Affairs. Included on this list are the United Arab Emirates, Singapore, and New Zealand.

137 In its 2003 annual report, The Singapore Airlines group generated S$1.8 billion in cash from operating activities. (This is roughly A$1.4 billion.) It lists total equity of S$10.6 billion.
“At the present time Emirates is probably the biggest current purchaser of new aircraft in the world.”^{38}

The value of aircraft on order is roughly $A31 billion.

10.4.14 In its 2003 Annual report, Emirates reported that it has AED$4.2 trillion (roughly A$1.5 billion) in cash. In addition, it has access to large amounts of financial capital to finance its massive expansion commitments.^{39}

10.4.15 It is useful to comment on the degree to which Emirates, Singapore and other carriers are overlapping the networks of Qantas and Air New Zealand. In a report submitted to the ACCC in the matter of re-authorisation of the Qantas-British Airways Joint Services Agreement (JSA), NECG documented cities connected by different air carriers.^{40}

10.4.16 NECG note:

• Even with the JSA, Qantas connects only six Australian cities to four European cities over Singapore with one stop services, allowing the sale of 24 city pair combinations.

• Singapore sells 40 city pair combinations from Australia to Europe.

• While Qantas sells 6 services from Asia to Australia, Singapore sells 168.

• Thai sells as many Australia to Europe city pair connections on a one stop basis as Qantas but sells 132 Asia to Australia connections on a one stop basis.

• As of May 2003, Emirates was able to sell 11 one stop city pair combinations from Australia to Europe, but has since expanded with increased non-stop destinations. Emirates already sells 143 Asia to Europe connections, and has only just begun its expansion.

10.4.17 The following table indicates the total city pairs connected by major FSA carriers operating to Australia:

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^{38} Page. 9.

^{39} Note that the Government of Dubai is the majority owner of Emirates, and this creates financing advantages.

^{40} NECG (2003), “Qantas and British Airways Joint Services Agreement: A report by NECG on economic issues relating to the pending application for re-authorisation of the Joint Services Agreement between Qantas and British Airways,” May.
Table 8: City Pairs connected by one stop service over hub

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Hub</th>
<th>Euro to Australia</th>
<th>Asia to Australia</th>
<th>Asia to Euro</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thai</td>
<td>Bangkok</td>
<td>24</td>
<td>132</td>
<td>352</td>
<td>508</td>
</tr>
<tr>
<td>Singapore</td>
<td>Singapore</td>
<td>40</td>
<td>168</td>
<td>224</td>
<td>432</td>
</tr>
<tr>
<td>Malaysian</td>
<td>Kuala Lumpur</td>
<td>15</td>
<td>136</td>
<td>102</td>
<td>253</td>
</tr>
<tr>
<td>Emirates</td>
<td>Dubai</td>
<td>11</td>
<td>13</td>
<td>143</td>
<td>167</td>
</tr>
<tr>
<td>Cathay</td>
<td>Hong Kong</td>
<td>12</td>
<td>60</td>
<td>75</td>
<td>147</td>
</tr>
<tr>
<td>Qantas/BA</td>
<td>Singapore</td>
<td>24</td>
<td>6</td>
<td>4</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: NECG, May 2003, "Qantas and British Airways Joint Services Agreement: A report by NECG on economic issues relating to the pending application for re-authorisation of the Joint Services Agreement between Qantas and British Airways."

10.4.18 Already two carriers provide service from Australia to Europe equal to or greater than that by Qantas and British Airways via the JSA. Every carrier dominates Qantas and BA combined in terms of service from Australia to Asia.

10.4.19 Unfortunately geographic location does not permit Qantas (or Air New Zealand) to use their home bases to connect traffic between world regions. While Emirates, which has only begun its major expansion, can use its home base to connect Asians and Australians (and New Zealanders) to Europe, there are no important beyond markets from the South Pacific.

10.4.20 Further, with the new 5th freedom opportunities (discussed further in section 10.5) available to Singapore, Emirates and others, they need only add one or two routes from Australia/New Zealand to match the Qantas and/or Air New Zealand service offerings Northeast to the important U.S. market.

10.4.21 As will be discussed further in the next section, the recent signing of open skies bilateral air service agreements by New Zealand and Australia, which grant unlimited (or unconstrained) 5th freedom traffic rights to carriers such as Singapore, Thai and Emirates,
have removed a long standing regulatory entry barrier and created the conditions for the first time to allow such carriers to break out of their home bases and envelop carriers such as Qantas and Air New Zealand which have limited potential to develop their own hubs.

10.5 **5th Freedom carriers**

10.5.1 The freedoms of the air were described in the Statement of Sean Ford (beginning at paragraph 23), and illustrated in the Statement of Michael Andrew Swiatek (beginning at paragraph 104). Fifth freedom rights allow a carrier from a “third” country, such as Singapore or the United Arab Emirates to fly from Australia to New Zealand. In the context of the trans-Tasman market, carriers such as Emirates and Singapore Airlines are referred to as 5th freedom carriers.

10.5.2 As indicated in Section 10.4, 5th freedom rights are an important and recently enabled vehicle by which well endowed air carriers can grow beyond their home markets and become global reach carriers, enveloping the networks of geographically disadvantaged and/or financially constrained air carriers.

10.5.3 A number of air carriers operate 5th freedom services in the trans-Tasman market. These were listed in the statement of John Fondren Harrison (at paragraph 53), along with their service frequency and schedules. Collectively, the 5th freedom carriers offer the following capacity and serve the indicated estimated traffic:

<table>
<thead>
<tr>
<th>Route</th>
<th>Percent of Total Seats</th>
<th>Percent of Total Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland – Sydney</td>
<td>25.4%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Auckland – Melbourne</td>
<td>28.3%</td>
<td>14.5%</td>
</tr>
<tr>
<td>Auckland -- Brisbane</td>
<td>30.4%</td>
<td>27.2%</td>
</tr>
</tbody>
</table>

Source: Statement of John Fondren Harrison, at paragraph 54

10.5.4 In addition, Emirates has indicated that it will commence service on the Melbourne-Christchurch route.¹⁴¹

10.6 The economics of 5th freedom services

10.6.1 Aviation economists sometimes view the economics of 5th freedom services as being of marginal economic viability. This is because the carrier is flying on a sector beyond its core markets. It will have relatively low brand recognition; its service frequency will be limited; and flight dispatch reliability can be less than competitors, as a late inbound aircraft from a long haul flight will delay the 5th freedom departure.

10.6.2 However, this view is incorrect for a number of markets. One set of circumstances where 5th freedom services are attractive is when the route range is beyond the limits of the carrier’s aircraft. Thus, service from Emirates to Auckland had required a stop en route, such as in Australia, although new aircraft types such as the A340-500 make non-stop service possible. The trans-Tasman market is geographically positioned such that 5th freedom services are attractive from origins such as the United Arab Emirates, or Argentina.

10.6.3 Second, 5th freedom services can have attractive economics if the operating parameters of the first sector require a long layover. In many cases an inbound flight cannot simply unload, reload and return to origin. Time zone differences combined with flight times may make such turnaround operations unattractive to passengers or in violation of noise curfews as it would entail an arrival in the middle of the night, or an arrival late in the evening with no connection opportunities. With an aircraft that would otherwise sit idle at Auckland, Brisbane, Sydney or Melbourne, flying it across the Tasman to generate some revenue could be economically attractive.

10.6.4 Third, a number of carriers today are investing in brand recognition on 5th freedom sectors so as to overcome what would otherwise be a disadvantage. Emirates has invested heavily in advertising and sponsorships in New Zealand and Australia and is becoming a top of mind brand in many travellers’ minds. Such brand identity investments are more common when the 5th freedom carrier is building a secondary hub of services with a range of non-stop destinations and beyond rights.

10.6.5 Fourth, because of the distances involved on the very long range routes (such as the route from Australia to Europe via Asia or from New Zealand to Europe via North America, the incremental revenues from 5th freedom operation are essential to the route economics. It must be kept in mind that both the Qantas and the Air New Zealand services to Europe depend on 5th freedom traffic for the economic viability of current service levels.

10.6.6 Fifth, 5th freedom services are a means to build a new destination prior to a destination being able to support itself on a non-stop basis. An example of this is Cathay Pacific's
service to New York from Hong Kong. This route was developed as Hong Kong – Vancouver – New York while the market built to higher traffic levels. Cathay is now beginning non-stop New York – Hong Kong operations. Interestingly, the carrier has had so much success with the 5th freedom sector, that it will continue the Hong Kong - Vancouver- New York flights even as it operates non-stop Hong Kong – New York. The fifth freedom increases the range of destinations from both Vancouver and New York, it provides New York originating customers with two different flight times, and it offers service redundancy in case of a delay or flight cancellation.

10.6.7 Some claim that 5th freedom operations come and go with changes in aircraft, variations in market demand, etc. There are some cases where such services can come and go, and the trans-Tasman has experienced this. However, the record on the trans-Tasman is that while some operators left the market, others entered. The statement of Norman John Thompson (beginning at paragraph 121) shows how there was a continuing 5th freedom presence on the trans-Tasman over an eight year period.

10.6.8 Robert Gurney of Qantas makes a similar observation in his statement (beginning at paragraph 37).

“The trans-Tasman routes, and particularly the routes into Auckland, have historically been, and continue to be, serviced by a large number of third country [fifth freedom] carriers.”

10.6.9 As well, it is essential to note the stable nature of the Qantas and Air New Zealand 5th freedom services to Europe. These 5th freedom services have been operated for decades, and there is no sign of their demise. Other cases also exist. Singapore Airlines has operated 5th freedom services from Singapore to Seoul to Vancouver for over two decades, even though it now has an aircraft capable of non-stop operation. The carrier has indicated that the Seoul – Vancouver service assists its market presence in both cities.

10.6.10 Further discussion of the economics of 5th freedom services can be found in the statement of Norman John Thompson (beginning at paragraph 108).

10.7 The Scope for 5th freedom services

10.7.1 The Statement of David Charles Hawes provides a list of Airlines with 5th freedom traffic rights between Australia and New Zealand via 5th freedoms.

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142 At the time the route was launched, Cathay did not have an aircraft capable of consistently operating non-stop from New York to Hong Kong in both directions. New aircraft, specifically the A340-500, now permit non-stop service.

143 At paragraph 38.

144 This is contained in his Appendix DCH-8.
10.7.2 Similarly, the statement of Sean Ford provides a list of New Zealand's air services agreements with foreign nations and indicates trans-Tasman 5th freedom opportunities.\textsuperscript{145}

10.7.3 A carrier can only operate a 5th freedom service on a trans-Tasman route if it has 5th freedom authorisation from both Australia and New Zealand. The following table provides a list of countries which have 5th freedom service authorisation from both Australia and New Zealand.

### Table 10: Nations with 5th freedom rights from both Australia and New Zealand

<table>
<thead>
<tr>
<th>Country/economy</th>
<th>Australian rights</th>
<th>New Zealand rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>2800 weekly seats allowed\textsuperscript{146}</td>
<td>Unlimited rights</td>
</tr>
<tr>
<td>Brunei</td>
<td>Some restrictions at some airports, unlimited at others</td>
<td>unlimited</td>
</tr>
<tr>
<td>Chile</td>
<td>2000 weekly seats</td>
<td>Unlimited</td>
</tr>
<tr>
<td>China</td>
<td>8500 weekly seats at four largest airports, unlimited at others</td>
<td>Allowed as specified points</td>
</tr>
<tr>
<td>Cook Islands</td>
<td>500 weekly seats</td>
<td>Unlimited</td>
</tr>
<tr>
<td>France</td>
<td>1200 weekly seats on Paris-Australia, 1000 seats on Tahiti-Australia</td>
<td>3 flights per week</td>
</tr>
<tr>
<td>Germany</td>
<td>21-25 flights per week</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Macau</td>
<td>3 flights per week</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15000 seats per week in four major airports, unlimited in other markets</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Norway</td>
<td>2800 seats per week</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Singapore</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Taiwan</td>
<td>3600 seats per week</td>
<td>7 flights per week</td>
</tr>
<tr>
<td>Thailand</td>
<td>35 flights per week</td>
<td>21 flights per week</td>
</tr>
<tr>
<td>Tonga</td>
<td>600 seats per week at four major airports, unlimited at</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

\textsuperscript{145} This is contained in his Appendix SF1, at pages 25-29.

\textsuperscript{146} 2000 weekly seats allows a daily flight.
<table>
<thead>
<tr>
<th>Country/economy</th>
<th>Australian rights</th>
<th>New Zealand rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Arab Emirates</td>
<td>42-44 flights per week at four major airports, unlimited at others</td>
<td>Unlimited</td>
</tr>
<tr>
<td>U.S.</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>U.K.</td>
<td>28 per week</td>
<td>7 per week</td>
</tr>
</tbody>
</table>

10.7.4 As can be seen, 17 countries/economies are able to grant trans-Tasman 5th freedom rights to their carriers. Other nations have fifth freedom rights from one country, reducing the threshold needed to launch service (only one bilateral needs to be renegotiated). Hong Kong may have rights, but the New Zealand – Hong Kong treaty is protected and this could not be verified.

10.8 Do 5th freedom carriers constrain the prices of Qantas and Air New Zealand?

10.8.1 5th freedom carriers often offer a substantial number of seats on the 5th freedom sector at low prices. There are both demand and supply side reasons for this.

10.8.2 First, the cost of operating the 5th freedom sector may be modest, thus supporting a lower price. If the aircraft would otherwise be idle there may be some capital cost savings. As well, airport staffing may have some economies. It is not uncommon that the customer service and other staff is paid for a set number of hours, even if the time is not fully used. Because this carrier has no other use for the paid labour, the incremental cost may be low of using otherwise idle time to service a 5th freedom flight.

10.8.3 Second, the low service frequency and lower dispatch reliability may result in consumers placing a lower value on the 5th freedom service, and hence a lower willingness to pay for the service.

10.8.4 For both cost and demand reasons, fifth freedom carriers offer a substantial number of seats for sale at low prices. This brings down the average fare paid by consumers on a route, even if the FSAs (i.e., the 3rd/4th freedom carriers – Qantas and Air New Zealand) do not change their prices.\(^{147}\)

\(^{147}\) The low fare capacity of the 5th freedom carriers entering the route will mathematically bring down the route average. It is almost inconceivable that the 3rd/4th freedom carriers would raise their prices (or reduce seat
10.8.5 However, the above is an extreme case. The seat management systems of Qantas and Air New Zealand will detect the loss of traffic to the new 5th freedom competitors. In these circumstances, it is far more likely that the 3rd/4th freedom carrier(s) would respond to 5th freedom entry or expansion by either reducing their fares or increasing the number of seats available for sale in the low fare classes. Clearly, this will lead to even greater decreases in average fares paid by consumers.

10.8.6 In his statement, Norman John Thompson documented the average net fares on individual trans-Tasman routes for the years 2000 to 2003. He observes that:

"Air NZ's average net fare on trans-Tasman routes has declined in the period from 2000-2003. The decline occurred across all sectors."

10.8.7 This decline occurred in a period prior to Virgin Blue’s announcement of its intent to enter the trans-Tasman market. This is suggestive of 5th freedom carriers providing a pricing constrain in the trans-Tasman market.

10.8.8 Robert Gurney also observes in his statement (at paragraph 43) that Qantas responded to 5th freedom entry. In his statement he does not provide data on Qantas’ average fares in the market, but points out new low fares that were introduced when Emirates entered the market.

10.9 Conclusions

10.9.1 This chapter discussed the economics of network envelopment. It pointed out that the preference of some consumers, especially frequent and higher yield travellers, for services from large network airlines drives carriers to strategies (when financial resources are available) that expand their network and envelope the networks of their competitors. Network envelopment is also motivated by the desire to expand the carrier’s overall traffic base and reap additional economies of traffic density.

availability at low fares) after entry by a 5th freedom carrier. Their seat management systems will detect the loss of traffic to the new 5th freedom competitors and respond by increasing seat availability in the lower fare classes. Thus, average fares on a route are almost assurred of falling, as the capacity of the 5th freedom carriers is sold at average fares below what prevailed prior to entry, and because the incumbent carriers respond with lower fares or increased seat availability in low fare classes.

Another aspect of this is that if the 3rd/4th freedom carriers do not reduce prices or increase discount seat availability, average fares in the market will still fall as the 3rd/4th freedom carriers lose traffic to the 5th freedom carriers. The weighted average fare in the market will be computed with a lower weight for the 3rd/4th freedom carriers simply due to their traffic loss as some former customers divert to the 5th freedom carrier. To the extent that the 5th freedom carrier stimulates the market, it will largely be due to lower prices, again bringing down the market average.

148 See paragraph 190 and following. Note that this is confidential data.
10.9.2 Qantas and Air New Zealand are especially vulnerable to network envelopment as their home markets are end of route destinations. They cannot use their hubs to envelop the networks of their rivals as that would involve too high a degree of circuity.

10.9.3 The challenges to the two carriers are due not only to geography, but also to access to financial capital, especially in the case of Air New Zealand. Qantas and Air New Zealand face network envelopment strategies by Emirates and Singapore (among others), who have access to large amounts of financial capital for fleet and service expansion, continuing service upgrading, innovation, etc.

10.9.4 The one important opportunity for Qantas and Air New Zealand to gain a strategic advantage is in being able to offer a unique network dimension – a comprehensive network of the combined Australia/New Zealand tourism market. Achieving this competitive advantage would be of great public benefit, as it would allow Qantas and Air New Zealand to better compete against alternative tourism destinations. Even a small shift of the massive global tourism market to a combined and enhanced Australia/New Zealand experience will benefit many businesses and wage earners in the two nations. This network enhancement, however, can only be enabled in the proposed Alliance.

10.9.5 This Section also looked at 5th freedom operations and described their economics. The trans-Tasman has characteristics which favour profitable 5th freedom operation, including the fact that many foreign carriers would otherwise have aircraft sitting at an airport in Australia or New Zealand that would otherwise be idle for many hours of the day due to time zone and curfew constraints at originating airports.

10.9.6 It was also observed that Qantas and the Air New Zealand services to Europe depend on 5th freedom traffic for the economic viability of current service levels. This provides strong evidence that 5th freedom operations can be sustainable, even in the long term.

10.9.7 Finally, this section discussed whether 5th freedom carriers act as a pricing constraint on the 3rd/4th freedom carriers. It was pointed out that even if the 3rd/4th freedom carriers (Qantas and Air New Zealand) did not lower their fares in response to entry or expansion by 5th freedom carriers, the low average fare of the latter would bring down the market average fare. Far more likely is that the 3rd/4th freedom air carriers respond to the 5th freedom carriers by lowering fares and/or increasing the capacity available in the lower fare classes. Evidence from Qantas and Air New Zealand supported this. Qantas reported specific fares it lowered in response to entry by Emirates, while Air New Zealand reported declines in its average from 2000 to 2003, a period which largely predated Pacific Blue.
11.0 Entry into Airline Markets in Australia

11.1 Introduction

11.1.1 This section looks into the issue of entry barriers to Australian airline markets.

11.1.2 The topic of entry barriers is extensively covered in the Statement of Janusz Ordover. Here, I focus my attention on two key areas where I have considerable experience: regulatory barriers and airport access. Much of my career has focused on the regulation and deregulation of air transport. As well, I have considerable experience in the area of airport management and regulation, including a period of time when I was a senior manager at the Vancouver International Airport Authority (which oversees the management not only of Vancouver International Airport, but also 15 other airports in the world).

11.2 Regulatory barriers

11.2.1 Economic regulation of an industry can be a barrier to entry. Economic regulation may be direct, e.g., via industry specific legislation. Economic regulation can also be indirect. In Australia, the process of obtaining import permits for aircraft was, historically, a means of controlling industry capacity.

11.2.2 The statements of David Charles Hawes (beginning at paragraph 5) and Sean Ford (beginning at paragraph 58) describe economic regulation in Australian and New Zealand. As well, they both cover the issue of regulation of international airline services, including the licensing of a carrier to serve the trans-Tasman market under either an international licence, or via a Single Aviation Market licence.

11.2.3 Today, in both countries, there are no impediments to entry to any airline seeking to operate domestic services, provided that airline can meet the safety requirements and can obtain insurance. National ownership is not a requirement for entry into domestic services, further reducing entry barriers. Virgin Blue was able to obtain a domestic Australian license and its subsidiary, Pacific Blue, was able to obtain a license for domestic New Zealand services. Qantas has been able to establish an airline to serve domestic New Zealand markets.

11.2.4 The only impediment to entry into trans-Tasman markets is meeting the ownership and control requirements. As described in the statements of Hawes and Ford, a carrier based in Australia or New Zealand may be licensed to serve the market either via the Single Aviation Market agreement, or via the traditional international air service license. There are no capacity limits or limits on the number of air carriers that may be authorised for
trans-Tasman services. Pacific Blue has been issued a licence as has Qantas’ Jet Connect subsidiary.

11.2.5 It is my opinion that there are no regulatory barriers to entry into domestic Australia, domestic New Zealand or trans-Tasman markets.

11.3 **Airport Access**

11.3.1 Since deregulation began in the U.S., the issue of airport access has often been identified as a critical entry barrier.

11.3.2 Inadequate capacity for runway services (takeoffs and landings) or for terminal services (gate access, ticketing positions, customs hall capacity) results in new entrant airlines being unable to access the level of airport capacity they need, or to be offered capacity at less preferred times. The lack of airport capacity has been a consequence of inadequate funding of airport expansion, complex regulatory or other legal processes for obtaining authority to expand airport capacity, and the refusal of airports or their regulators to allow economically rational pricing practices which would ‘price out’ excess demand at peak periods and transfer it to off peak periods.¹⁴⁹

11.3.3 The U.S. has four airports which are slot controlled by an Act of Congress,¹⁵⁰ and many others which are seriously congested. In Europe, almost all the major hub airports are seriously congested. Asia has faced similar problems, but in a number of nations (e.g., Korea, China, Hong Kong) major expansions have been made to alleviate the problem. Even Japan has been able to construct new airport capacity. In Canada, Toronto Pearson airport had been seriously congested for both runway capacity and terminal access, with the Minister of Transport imposing a slot allocation system on the airport.¹⁵¹

11.3.4 Australia and New Zealand have had unique airport access challenges. Historically, the airlines invested in their own, exclusive use terminals for domestic services. While the airline industry was regulated, this posed no problem and relieved the government (owner of the airports at the time) of some investment burdens. However, when the airline industry was deregulated, new entrants faced challenges in obtaining access to terminal services, and this may have been a factor in some failed early entry attempts. Sydney

¹⁴⁹ Economists are nearly universal in advocating peak period pricing schemes for airports, while airports and/or regulators have almost universally opposed such rational pricing schemes. Airport users, specifically airlines, generally oppose peak period pricing schemes.

¹⁵⁰ These are Chicago O’Hare, New York Laguardia, New York Kennedy (JFK), and Washington Reagan.

¹⁵¹ Toronto’s congestion has eased significantly since 2001, due to reduced demand (9/11, SARS and Air Canada bankruptcy), opening a new runway, and opening a new terminal
also had inadequate runway capacity prior to 1994, and this too was a barrier to entry.\textsuperscript{152}

11.3.5 However, airport access is no longer a barrier to entry in either Australia or New Zealand. Perhaps the critical event was the privatisation of the airports in both countries. The private sector owners find it in their financial interest to accommodate new carriers or expansion of services by existing carriers. Airport revenues and profits depend on increasing traffic levels, and airport operators have strong incentives to accommodate new services. A number of airports in the two countries now have common use terminals for domestic services, such as Wellington, Christchurch and Sydney.\textsuperscript{153}

11.3.6 Virgin Blue has been able to get access to terminal services at every airport they serve. In some cases, such as Sydney, they used temporary facilities while a permanent solution was found, but nevertheless were able to operate effectively and enter the market.

11.3.7 The one airport which lacks a common use domestic facility has been Auckland. However, the Auckland International Airport Corporation is currently investing in additional capacity and has formally indicated it is able accommodate domestic services by Pacific Blue.\textsuperscript{154}

11.3.8 Thus, unlike the case in the early 1990s, access to airport services is not a barrier to entry in either Australia or New Zealand.

11.4 \textbf{Other barriers to entry}

11.4.1 Professor Janusz Ordover has provided a statement which addresses the topic of entry barriers at great length. His statement separately treats the issues of:

- regulatory approval;
- scale and scope of entry;
- access to feeder services;
- brand recognition;
- access to travel distribution services;
- capital requirements;

\textsuperscript{152} Sydney opened a new, parallel runway in 1994, which has improved access to runway services.

\textsuperscript{153} Sydney Airport Corporation purchased the former Ansett domestic terminal, which is now a common use domestic terminal.

\textsuperscript{154} Auckland has always been in a position to accommodate trans-Tasman or other international services in its common use international terminal.
• loyalty schemes (frequent flyer programs);

• access to airport facilities and slots;

• other sunk costs;

• competitive response; and

• business customers.

11.4.2 I have reviewed his discussion and analysis and fully support his key conclusions. My specific opinions in regard to Prof. Ordover’s findings are as follows:

• Regulatory approval is not a barrier to entry or expansion to either Virgin Blue or de novo entrants.

• Scale and scope of entry is not a barrier to entry on trans-Tasman routes. While economies of traffic density exist for a route, that has not prevented LCCs throughout the world from entering airline markets. Of importance in this regard is the large cost advantage which most LCCs enjoy relative to their FSA competitors.

• Access to feeder traffic appears to not be a barrier to entry on trans-Tasman routes. Pacific Blue has access to feeder traffic from Virgin Blue. As well, as noted by Prof. Ordover, the trans-Tasman routes have a high percentage of origin-destination traffic, greatly reducing the need to rely on connecting traffic.

• Brand recognition appears to not be a barrier to entry. Around the world, LCCs have been established with new brands which have achieved high market recognition rates. Virgin Blue successfully established itself in Australia, in part by leveraging off the globally recognised Virgin brand, and Pacific Blue is leveraging off Virgin Blue’s brand.

• Access to travel distribution services appears to not be a barrier to entry. Of special importance here is the recent development of the internet as the primary means of selling the simple itinerary air travel product. Both LCCs and several subsidiaries of FSAs are achieving internet sales ratios greater than 75%, with some in the 90% range.

• Access to capital is not a barrier to expansion or de novo entry on trans-Tasman or domestic routes in Australia and New Zealand. Of special importance is that both nations have effectively removed foreign ownership restrictions on financial capital for domestic airlines.
The experience of LCCs around the world is that loyalty reward programs are not necessary for growth or success.

Access to airport slots and terminal services are not presently a barrier to entry or expansion on domestic or trans-Tasman routes. This was not the case a decade ago, but airport privatisation and expansion has remedied a previous significant barrier to entry.

Sunk costs were not a barrier to Virgin Blue/Pacific Blue’s entry into domestic Australia or trans-Tasman routes. Other LCCs, generally starting from a very small base, have also been able to enter markets in the face of FSA sunk costs.

It is my view that predatory conduct by incumbent air carriers is a possible competitive response to entry or expansion. Nevertheless, it has not deterred the entry or expansion of Virgin/Pacific Blue. I note that Qantas is a profitable air carrier and has shown that it can and will adjust capacity offered so as to maintain its profitability in the face of traffic declines.

Obtaining business passengers is not a barrier to expansion or de novo entry on domestic and trans-Tasman routes. As I discussed in Section 3, the removal of the round trip requirement for access to low fares has resulted in LCCs successfully penetrating the business travel market segment.

### 11.5 Conclusion

11.5.1 It is thus my conclusion that there are no significant barriers to entry into domestic markets in Australia and New Zealand, nor onto the trans-Tasman market. My opinion also extends to the cumulative height of entry barriers.

11.5.2 It would have been my view fifteen years ago that regulatory barriers to entry were significant and unlikely to be overcome. In testimony elsewhere I offered such an opinion, referring to barriers to entry that were insurmountable. However the current situation is much changed. Deregulation in Australia, New Zealand and elsewhere (including via bilateral air services agreements granting unconstrained 5th freedom rights) has completely removed regulatory barriers to entry. Airport privatisation and investment have removed this former important barrier to entry in the Australia / New Zealand markets. As well, the business model of the new low cost carriers have found the means to win customer patronage when competing against FSAs with loyalty programs (via dramatically lower costs which enable dramatically lower fares without the requirement Saturday stayovers) and long standing relationships in the travel distribution chain (via use of much less expensive internet booking).

11.5.3 It also would have been my opinion ten years ago that airport access constituted an
insurmountable entry barrier. Airport privatisation and investment have removed this barrier to entry. The last challenge in this regard, access to domestic terminal capacity at Auckland, has been addressed and removed.
12.0 The State of Competition in Australian Airline Markets

12.1 Introduction

12.1.1 I have been asked to comment on the current state of competition in the markets under consideration, including by reference to barriers to entry or expansion. I have also been asked to comment how, in the present case, those markets sit against the analysis of economic theory and literature and experience in other countries?

12.1.2 Here, in addition, I also discuss in this section the issue of counterfactual scenarios, and competitive constraints on the alliance for the factual scenario.

12.2 Domestic markets

12.2.1 Australia’s major domestic routes are almost all served by both a single FSA and an LCC.

12.2.2 The domestic market has made a transition from service by 2 FSAs, in some cases with one or more LCCs in the market, to single FSA service with an LCC. The confidential data provided in Confidential Appendix Q indicate that Qantas’ fares on the major routes are as low or lower than they were when served by 2 FSAs.

12.2.3 The minor domestic routes are served by a regional carrier which is a subsidiary of or affiliated with an FSA and some have competing service from an independent regional carrier, such as Regional Express. The independent regional carriers provide some connecting services to Air New Zealand and provide some connecting services to Virgin Blue and foreign carriers.

12.2.4 These regional markets could be affected by the Alliance as the independent regional carriers would lose some feed traffic from Air New Zealand. But they would retain all existing non-stop and connecting domestic origin-destination feed traffic, feed traffic from other international carriers, and potentially increase connecting traffic to Virgin Blue’s trans-Tasman network, either via the traveller simply connecting two separately purchased tickets, or via a formal relationship with Virgin Blue. Although to date such arrangements are not common, Virgin Blue and Regional Express have entered into a simple interline agreement.
12.3 Trans-Tasman

12.3.1 Trans-Tasman market is currently served by:

- Qantas and Air New Zealand on most major routes;
- Air New Zealand’s Freedom Air on a number of routes, generally secondary routes with limited frequency and no network connectivity;
- 5th freedom carriers on all major routes to Auckland;
- Shortly by a 5th freedom carrier, Emirates, from Melbourne to Christchurch; and
- Virgin Blue with four non-stop trans-Tasman routes, and an announced intention to eventually serve all major trans-Tasman routes.

12.3.2 The Auckland routes enjoy the presence of a large number of seats from 5th freedom carriers. While these carriers may come and go, there has been a stable presence of such carriers. These carriers have offered significant levels of capacity at low fares, including discounted business class and first class fares.

12.3.3 Second, an LCC has entered four of the routes and is poised to enter others. The routes entered are notable since they do not have 5th freedom traffic. Third, there is a subsidiary of each of Qantas and Air New Zealand operating on some routes, with these subsidiaries having lower costs. Even if they remain the only carrier on a route, the evidence suggests that these subsidiary carriers will have fare and service offerings similar to that which would prevail if an LCC were present. Fourth, the evidence suggests that the LCC effect is likely to spread to other routes, even those unserved at present by the LCC.

12.4 Other South Pacific routes

12.4.1 Other routes in the South Pacific, such as to Vanuatu, are served by Qantas and foreign air carriers. Air New Zealand is not directly present on these routes, although it provides some 6th freedom competition.

12.4.2 Pacific Blue has announced it will begin service on one South Pacific route, and has indicated it may expand its South Pacific service offerings over time.

12.5 Australia – U.S.

12.5.1 The market from Australia to the U.S. is directly served by two FSAs: United and Qantas. United provides service from Los Angeles and San Francisco in the U.S. and serves both Sydney and Melbourne in Australia. Qantas flies non-stop from Los Angeles to Sydney.
and Melbourne, and in May will begin non-stop service to Brisbane. Qantas flies on a one stop or connecting basis to New York three times per week. Both Qantas and United provide connections at the U.S. west coast gateway to a variety of U.S. destinations. United does this on-line, while Qantas does this via American Airlines and Alaska.

12.5.2 This market is also indirectly served by 6th freedom carriers, such as Air Pacific, Air Tahiti Nui, Air New Zealand, and Air Canada.¹⁵⁵

12.5.3 In the past, Air New Zealand served the market on Sydney-Los Angeles, but without the feed traffic it formerly had from Ansett in beyond-the-gateway markets, the route’s viability declined and it eventually exited the market. It now serves it only on a one stop basis over Auckland. It is unlikely that route economics will change in the future to induce Air New Zealand to return to the Sydney-Los Angeles route.

12.6 Other long haul routes

12.6.1 The overseas long haul markets are relatively unaffected by the alliance as there is no route served by both Qantas and Air New Zealand. Any effect which could take place is due to the loss of trans-Tasman feed traffic to carriers in the alliances which will be dropped by the Qantas-Air New Zealand transaction. The presence of the 5th freedom carriers on the major trans-Tasman routes mitigates against this. The ability to utilise the LCC trans-Tasman services is another mitigating factor. There are low entry barriers to 5th freedom carriers on the trans-Tasman routes.

12.7 Likely counterfactual scenario

12.7.1 I have been asked to comment on my views as to the likely counterfactual, or on my view of a range of likely counterfactuals.

12.7.2 It is my opinion that the confidential counterfactual case put forth by Qantas is reasonable and likely. It represents a good strategic response to the conditions emerging in its markets. These conditions include growing network overlap by carriers such as Emirates and Singapore, and competition from LCC Virgin Blue. To meet network overlap, it is logical for it to seek to obtain a higher city presence across the Tasman and within domestic New Zealand. This will protect it from a weakening position as Emirates, Singapore and potentially other carriers increase their presence in these markets. The deployment of additional capacity is likely to give it a disproportionately higher return in

¹⁵⁵ Although the amount of traffic is somewhat limited, Air Canada does carry passengers from U.S. points via Vancouver or Toronto to Sydney. I have personal familiarity with analysis of traffic in these markets and observe that Air Canada has been successful in attracting passengers from the Pacific Northwest (primarily Washington State) and the U.S. Northeast (including Boston, New York and to a limited extent, Chicago).
terms of increased traffic, as was explained by Seabury Airline Planning Group in their submission to the New Zealand Commerce Commission in July 2003.

12.7.3 However, it is also my view that the confidential Qantas counterfactual represents only a likely short term development. In the medium term, it is my opinion that the most likely counterfactual will include Air New Zealand exiting the market. This is for the following reasons:

- Air New Zealand faces increasing network envelopment by Qantas, which in turn is facing envelopment on much of its entire international route system by Emirates and/or Singapore. The recent open skies bilaterals entered into by various combinations of the U.S., New Zealand, Australia, Singapore, the United Arab Emirates and others have removed regulatory barriers to entry and are creating the conditions for Singapore (which owns 40% of Virgin Atlantic) and Emirates, in particular, to envelop Air New Zealand and Qantas. Both Singapore and Emirates have access to massive amounts of financial capital to support their growth to and beyond the Australian markets, simultaneous with expansion elsewhere.

- It must be recognised that as governments remove entry barriers via advanced open skies agreements, the stronger carriers will use the new freedoms to build ever more extensive carriers. This in turn will force the smaller FSAs from the market, as economies of traffic density and consumer preferences for larger carriers indicate few markets in the world can support more than two carriers.

- Air New Zealand’s product is becoming dated, relative to the offerings of Qantas, Emirates, Singapore and others.

- Air New Zealand has not been able to consistently earn an adequate return on its long haul international route system.

- Air New Zealand will face the need for major fleet renewal. While this will become of urgent necessity in 5 or so years, the carrier will need to make a commitment prior to the point when it has to replace its fleet.

- Air New Zealand, while it has marginally improved performance (due, in large part, to recent exchange rate movements), [Confidential Information].

- This will weaken its traffic base.

- It is my opinion that the Government of New Zealand, the Kiwi shareholder, will be unlikely to invest further major capital in Air New Zealand. First, it has stated that this is its policy. Second, unlike the case in September 2001, it has exemplars in other countries of governments being willing to let their carriers fail rather than continually
invest in them. Third, the magnitude of a reinvestment would amount to a staggering
tax burden. The previous bail out investment of roughly NZ$1 billion amounted to an
average of $250 per capita, or $1000 per tax paying family of four. Further tax
burdens of this magnitude at a time when the government has so many other priorities
seem to be unlikely and without a current global precedent.

• While it may have the financial resources to renew some aspects of its product, or to
replace part of its fleet, or to finance some additional expansion, it does not have
access to the financial resources for all three. All three, however, will be required for it
to survive to the medium term.

• While Air New Zealand [Confidential Information].

• Thus as it faces network envelopment on its international routes and increasing fare
pressures on its domestic and trans-Tasman routes from Virgin Blue, Qantas and 5th
freedom carriers, it will reach the point where its positive cash reserves fall to the
critical level which, with the lack of New Zealand law for reorganisation with bankruptcy
protection, will force it to cease operations.

• There are other possible counterfactual scenarios which could see Air New Zealand
survive, although barely. These would require events which are significantly less
likely, such as a failure of Qantas or Virgin Blue. These are remote events for the
medium term, in my opinion. Even absent aggressive envelopment by Emirates or
Singapore, I believe Air New Zealand will still face network envelopment and trans-
Tasman and domestic revenue erosion.

12.7.4 Deferral of the Alliance for two years will not result in Air New Zealand being in a more
favourable financial position which would allow it to renew its product and address network
envelopment. It will merely make the challenges it faces more visible to the public and the
government. In two years time, Virgin Blue will have entered most major trans-Tasman
and domestic New Zealand markets, and Emirates and/or Singapore will have further
expanded their networks to overlap Qantas and Air New Zealand. Two years time will
result in the removal of any question as to the counterfactual capacity expansion by
Qantas on the trans-Tasman as it seeks to address network envelopment. As well it will
make clear the reduced role Air New Zealand will have in trans-Tasman freight markets as
it deploys the limited cargo capacity A320s.

12.7.5 There are two detriments of postponement. First, Australia will forego the considerable
benefits from the Alliance, including a) the cost reductions, b) sharing of these through
lower fares, c) the travel time savings and other network enhancement benefits consumers

156 [Confidential Information].
make clear the reduced role Air New Zealand will have in trans-Tasman freight markets as it deploys the limited cargo capacity A320s.

12.7.5 There are two detriments of postponement. First, Australia will forego the considerable benefits from the Alliance, including a) the cost reductions, b) sharing of these through lower fares, c) the travel time savings and other network enhancement benefits consumers would have enjoyed, and d) the tourism development benefits of the Alliance.

12.7.6 Second, postponement will result in further steps by Emirates and/or Singapore to envelop the network of Qantas. Without the alliance, Qantas may divert resources and organisational focus to development of city presence in New Zealand and on trans-Tasman routes. With the alliance, efforts can be focused on greater overall network enhancement, strengthening its hub in Singapore, etc. Resources to develop capacity on the trans-Tasman and domestic New Zealand routes could have been devoted to expanding the overall Qantas/Air New Zealand network out of Australia. This would have been of greater benefit to the carriers, to consumers in Australia, and to Australia’s tourism and other industry.
13.0 Public Benefits

13.1 Introduction

13.1.1 I have been asked to offer my opinion as to:

- the weighting of the benefits and detriments of the Alliance?
- the benefits or detriments of deferring any decision on the Alliance for, say, two years?
- whether Qantas and Air New Zealand can achieve the benefits of the Alliance by restructuring their existing business operations (e.g., Tasman Express) or through lower cost subsidiaries (e.g., JetStar and Freedom) without the Alliance?

13.2 Comments forthcoming

13.2.1 I will provide my comments on the measurement and weighting of the benefits once I have an opportunity to review the statement of Mr. Henry Ergas.
14.0 Conclusions and Opinion

14.1 Introduction

14.1.1 In this section, I review each question put to me by counsel, and offer my opinion.

14.1.2 I indicate the questions in italics, and follow each question with my opinion.

14.2 The LCC and FSA business models

14.2.1 Explain the nature of the traditional full service airline (FSA) product.

14.2.2 The FSA business model emerged over the past sixty years offering a high value product to all of its customers. Of greatest importance is that the focus of the FSA business model has been on providing and enhancing network connectivity for travellers. This included investing in major systems to facilitate the sale of tickets by different airlines and their agents, development of standards for accepting customers of other airlines and their baggage, developing systems and procedures for the transfer of passengers and their baggage, investing in additional aircraft and other resources in order to provide high quality services with a high degree connectivity and convenience, etc.

14.2.3 The FSA product is an inherently costly product to provide. High FSA costs are partially due to the high costs of providing the value added network and other services, and partially to legacy costs. The latter are due, in part, to collective bargaining gains of organised labour at FSAs during the period when they were owned and/or regulated by governments.

14.2.4 The FSA product has substantial economies of traffic density, whereby it is cheaper per passenger to provide multiple services by one or two carriers, than it is to have multiple carriers individually provide low levels of service. The existence of a high degree of economies of traffic density is borne out by the fact that roughly 90% of the airline routes in the world only support service by 1 or 2 air carriers.

14.2.5 Consumers have revealed that when they need services which require connections, they strongly prefer single airline services, or services provided by highly integrated airline alliances. As a result, FSAs are pursuing network expansion strategies to better serve the market according to its wishes. One consequence is that well funded carriers are pursuing strategies to envelope the networks of their competitors, and thus win favour from customers seeking service from the carrier with the most extensive network for their needs. Further, some of these network carriers are generating sufficient financial returns to allow them to continue to invest in their product, in terms of network and frequency
expansion, aircraft, in-flight service, and on the ground service. Carriers unable to make investments in all of these areas will increasingly suffer a competitive disadvantage.

14.2.6 Explain the low cost carrier (LCC) product.

14.2.7 In roughly the last ten years, LCCs have successfully learned to replicate the highly successful business model of Southwest Airlines, albeit with variations. Coupled with deregulation and removal of other entry barriers (especially airport capacity), LCC carriers are emerging throughout the globe. Because of their appeal to consumers, as well as their strong financial performance and ability to finance significant expansion, their continuing expansion is inevitable.

14.2.8 The business models of LCCs such as Virgin Blue/Pacific Blue, Southwest, WestJet, Ryanair, EasyJet, JetBlue, Air Tran, etc., have proven themselves to be highly sustainable. They have earned strong and consistent profits, which have resulted in healthy balance sheets. This has enabled them to achieve high market capitalisations, in many case much higher than larger FSAs, signalling that the market is more willing to finance their expansion than to finance growth of the existing number of FSAs. They are able to finance significant capacity expansion and have roughly 1500 aircraft on order, almost all of which is expansion, rather than replacement, capacity.

14.2.9 The LCCs have had a dramatic impact on competition in airline markets by undermining the traditional price discrimination schemes of the network air carriers. The sale by LCCs of heavily discounted one way tickets has opened up access to significantly lower fares in airline markets, even for business travellers. This has been the largest impact on price competition in airline markets in the past 30 years, a much larger impact than competition between FSAs has had on prices paid by consumers.

14.2.10 The expansion of LCCs is undermining the viability of some FSAs, especially small FSAs. The large numbers of FSAs in the world is a consequence of government policies restricting foreign ownership of airlines. As the LCCs expand and serve up to 50%, or possibly more, of domestic and short/medium haul intra-continental markets, the FSAs will need to consolidate. Outside of the U.S., air carrier consolidation will need to involve some form of cross border transaction, if not outright merger, then strong carrier alliances.

14.2.11 The LCCs have induced benefits for travellers on the FSAs. The impracticality in the presence of LCCs of the traditional FSA pricing practices (imposing restrictions on trips such as requiring purchase of return fare and Saturday stayover in order to obtain a discounted fare) has resulted in major reductions in fares paid by FSA travellers, including business travellers, even those with multi-stop itineraries.

14.2.12 Thus far, LCCs have not pursued intercontinental markets, where network connectivity and other services are of greater importance.
14.2.13 What are the economic issues facing an FSA in respect of entry and expansion of an LCC?

14.2.14 The entry of an LCC into an FSA’s markets immediately and permanently undermines the revenue base of the FSA. The availability of low fare one way tickets from LCCs means that FSAs can no longer earn superior revenues from high willingness to pay customers, including business travellers.

14.2.15 Faced with an inevitable loss of revenues, FSAs must lower their costs. This is a challenge as these carriers face both the inherent costs of their network product and high legacy costs, and they must find a means to lower unit costs while maintaining their network scope, frequency and connectivity to retain those customers who need the FSA type of value added service. But lowering costs by reducing service also undermines the network product, reduces an FSA’s competitiveness and, ironically, pushes the carrier backward, up the economies of traffic density curve.

14.2.16 There are a number of means for an FSA to lower its cost to meet the competitive pressures from LCCs, yet maintain the network connectivity of their product. One way is to introduce a subsidiary or brand that allows the FSA to lower some of its costs and/or reduce consumer expectations regarding service quality. This is not without risk, however. The record shows that most FSA experiments with subsidiary carriers and low fare brands have not achieved long term (or even medium term) success. As well, the subsidiary/brand services can dilute the strength of the FSA’s network and undermine the goal of maintaining network depth and frequency, and may cannibalise the FSA’s own revenues. At best, subsidiary or similar types of solutions are only part of a larger solution.

14.2.17 A second means to lower cost while preserving network connectivity is to seek consolidation with other FSAs. This might be accomplished by merger, or where that is blocked by foreign ownership restrictions in treaties or national law, by highly integrated alliances. The business model here is to pool network frequencies and capacity to maintain or enhance consumer choices and connectivity, while shedding capacity and the resulting costs which would otherwise be deployed without consolidation. Consolidation allows the FSAs to maintain or improve economies of traffic density even when yielding market share to LCCs.

14.2.18 This type of network consolidation can lower costs and increase consumer satisfaction by improving schedule spread during the day. As well, there is potential for the consolidated operation to enable new non-stop air services in markets which are not economically viable with multiple FSAs. Non-stop service of origin-destination demands are less costly to provide as they involve less flying and the shedding of connection costs for those passengers utilising them. These services are also more highly valued by travellers, who
may be willing to pay a fare premium for their greater service convenience. As well, the Alliance will enhance network connective, for example, by better schedule dispersion, creating additional value for travellers.

14.2.19 A third means of addressing the FSA challenge is to exit the industry. The examples of Ansett, Sabena and Swissair demonstrate that carriers and their governments are willing to embrace this option. As well, mergers such as that between Canadian and Air Canada, are another means.

14.3 Alliances and Mergers

14.3.1 To what extent are alliances or mergers occurring between FSAs in the world industry and why?

14.3.2 Because of foreign ownership restrictions in national laws or treaties, we have observed no mergers of airlines in different countries. However, in those major markets which had multiple air carriers, almost every nation has witnessed mergers of almost every one of its major FSAs. This includes the U.S. (American, United, Delta, Northwest, Continental, US Air, FedEx), Canada (Air Canada, Canadian), Australia (Qantas, Australian), the U.K. (British Airways, British Caledonian), France (Air France, Air Inter, UTA), and Japan (Japan Airlines, Japan Air System).

14.3.3 The fact that virtually every large domestic market has had mergers of its FSAs (and LCCs) indicates the strong economic pressures which are driving industry consolidation. These pressures include supply side forces (strong economies of traffic density) and demand side forces (consumer preference for carriers with large networks). Economies of traffic density favour consolidation to fewer carriers on any given route, and consumer preferences for large network carriers favour mergers which increase the scope of the network.

14.3.4 While mergers across national frontiers are not currently possible, air carriers have sought to achieve as many of the economies a merger would have delivered by entering into various types of alliances. Over the years, these alliances have become more and more integrated, in order to deliver more of the cost savings and large integrated network benefits a merger would have enabled.

14.3.5 The scope of alliance development has been increasing, and greater integration has been taking place. Regulatory authorities have been approving many of the requested alliances because of

a) the benefits they produce for consumers and carriers, and

b) the absence of evidence of the exercise of market power by alliances.
Effectively, the only alliances which have been denied by regulators in the U.S., Canada, and Europe, have been those with serious entry barriers due to severe infrastructure capacity constraints. Specifically, the alliance between British Airways and American Airlines has not been allowed to date, due to an inability to mutually solve the issue of slot access at London Heathrow airport. Other alliances (e.g., United-Lufthansa-SAS, KLM-Northwest, KLM-Alitalia, KLM-Air France) have been approved.

14.3.6 There is some evidence which suggests that these alliances produced lower fares for consumers, greater connectivity, and lowered costs for carriers.

14.3.7 More recently, a new phase has emerged in alliance building which involves the creation of alliances that are increasingly like mergers. This has been driven by the need to extend network breadth and depth to avoid being overlapped by competing carriers, and to achieve this while reducing costs so as to compete against the onslaught of LCCs in short and medium haul markets. The near-merger alliance between Air France and KLM is a recent example of this trend.

14.3.8 It is not surprising that Qantas and Air New Zealand seek to form an Alliance. Carriers all over the world are responding to the twin forces of maintaining or expanding economies of traffic density and other cost savings from consolidation, as well as strong consumer preference for service by large network air carriers. The proposed Alliance is a natural step in the evolution of the FSAs toward higher concentration as LCCs rapidly gain market share, and as global reach carrier networks develop.

### 14.4 Competitive significance of LCC presence versus a 2nd FSA

14.4.1 What does economic theory and the economic literature demonstrate about the competitive significance for the airline industry of the introduction or potential introduction of an LCC, with or without a second FSA?

14.4.2 An extensive review was conducted of the economics literature regarding the effect of market structure on prices in airline markets. This literature has largely been based on U.S. data, in part because only the U.S. has publicly available data on individual ticket purchases, from which average prices can be computed. Because of the large number of fare classes on any route, use of any single published fare can conceal what consumers are actually paying in markets. As well, the U.S. has had the longest experience with deregulated markets.

14.4.3 The U.S. based literature began with an investigation of whether hub dominance was resulting in exploitation of market power by dominant hub carriers. However, it quickly emerged that so called hub premiums were in large part due to factors other than exercise of market power.
14.4.4 The literature thus branched out to investigate other issues, primarily that of the impact of LCCs on average fares paid.

14.4.5 A separate literature has begun to investigate the impact of international airline alliances on fares, although this is constrained by the lack of data on average fares paid by international consumers.

14.4.6 The hub dominance literature initially indicated that fares were higher for trips that originated from hub airports. A 1990 study by the U.S. General Accounting Office (GAO), for example, suggested that the hub premium, in terms of fare paid per mile flown, was 27%. However, these findings by the GAO did not control for key market characteristics which might explain why hubs would naturally have higher fares, and did not examine the impact of the presence of an LCC in the market. To address this, researchers began to estimate statistical regression models, which allowed for ‘explanatory’ or ‘control’ variables, which could separate out the effects of market characteristics from any hub dominance effect. It was found that most of the hub premium could be explained by the fact that trips from hubs tend to be of shorter distance than non-hub trips. Because there is a well known tapering of cost (and hence revenue) per seat kilometre with distance,\(^{157}\) the hub premium was disguising what was really a ‘short haul’ premium. Research by Morrison and Winston, for example, found that a 33% hub premium in their data set was reduced to only 5.2% when market characteristics such as route distance were properly accounted for. The short haul effect, alone, accounted for almost 18% of the 33% fare premium.

14.4.7 Over a period from 1987 to 2003, a series of papers refined and expanded the investigation of the impact of market structure on fares. By 2003, the literature was indicating that:

a) the fare premiums in concentrated markets (such as hub premiums) are due to a very large extent to market characteristics (such as trip distance and whether a route serves a high portion of business trips) and not merely to market structure. Market structure is one of the smaller explanations of the fare premium; and

b) the true hub premium, if any, is 5% or less, with many studies finding premiums in the range of only 2-3%.

14.4.8 As the investigation of hub premiums progressed, research revealed that a strong determinant of average fares on a route was whether or not Southwest Airlines (the original successful LCC) is present on the route. This led to a literature extension which separately looks at the effect of Southwest on average fares, and eventually to a more generalised effect of the presence or not of LCCs. This literature found that:

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\(^{157}\) This means that it does not cost double to fly a route of double the distance, there are economies associated with route length.
c) Regardless of market structure, the presence of an LCC has a significant and dramatic impact on fares in the market;

d) The LCC effect is also present on routes where an LCC is not present -- where an LCC serves one or both ends of the route, but not the route itself, average fares tend to be lower, although not quite as low as if the LCC operated directly on the route; and

e) The LCC effect is much larger than any hub premium which might be present in a market. The impact of LCC entry, for example, was being observed as resulting in reductions of average fares paid of up to 48%, with several studies showing impacts above 30%. These impacts were being found whether or not a route had one or more endpoints from a hub with a dominant air carrier.

14.4.9 While the literature was not intended to address this question, it was suggesting that if a choice has to be made between a market structure with one FSA and an LCC, versus one with 2 FSAs and no LCC, the former results in dramatically lower prices in the market. This is true even if one or both of the two FSAs dominate a hub. The literature does not provide the ability to directly address the question as to what impact the presence of a 2nd FSA has in a market with an LCC. I specified an econometric regression analysis to address this question.

14.4.10 What does the available data show on the effect of the introduction or potential introduction of an LCC, with or without a second FSA?

14.4.11 The literature review which I undertook indicates that this precise question has not been addressed. To rectify this, I specified an econometric model which would address the question, and asked Morrison and Winston to estimate the model using the U.S. data set and estimation methods they have used in their own, earlier studies.

14.4.12 The results indicate the following key findings:

- A route served by 2 FSAs and no LCC will have average fare levels 33% higher than a route served by one FSA and one LCC.

- If a route is served by an LCC and one FSA, then the impact of a second FSA is only to lower average fares by 2%. This 2% fare reduction is not statistically significant and the actual effect may be zero.

- The above support the conclusion that the single most important effect on average fares is whether the route has an LCC or not. The number of FSAs has minor impact, if any, if there is an LCC on the route.

- If the route is served by an LCC with 5% of the route’s seat capacity, then average fares are 16.4% lower than if an LCC is not present on the route. Thus even a small
capacity share by an LCC will have a substantial impact on fares. This impact (16.4%) is many times larger than the impact of having a second FSA on a route with an LCC. As the LCC increases its capacity on a route, then fares will decline further, although this effect varies somewhat depending on the specific LCC. For example, it was found that when Southwest Airlines has a 20% capacity share, average fares on the route are 27% lower than they would be in Southwest’s absence. Other carriers had somewhat larger or smaller effects, with most at least half the impact of Southwest. The carriers most similar to Virgin Blue (JetBlue, Southwest, Spirit) had impacts almost the same as that of Southwest.

The findings of this research make clear that:

a) the most important factor affecting fares on an airline route is whether or not an LCC is present;

b) the impact of an LCC is large, even for very small LCC capacity shares; and

c) the presence of a second FSA has a minor impact on fares on a route, given that an LCC is present. In fact, the minor (2%) impact of the second FSA on a route is not statistically significant and could be zero.

14.4.13 The above findings are based on U.S. data. Because The U.S. population is much greater than that of Australia and more geographically dispersed, etc., it is desirable to seek evidence from markets other than the U.S.

14.4.14 While data does not exist for other markets to allow the same type of econometric analysis, I have investigated available evidence for markets in Canada and Europe as to the impact of the presence of a 2nd FSA in a market served by an LCC.

14.4.15 Canada is more similar to Australia in that its population base is much smaller than the U.S., its population is not as geographically dispersed as in the U.S., it has a shorter history with deregulation, and it made a transition from a market structure with two FSAs and one LCC to a structure with one FSA and one or more LCCs. An investigation of 11 Canadian routes which saw service reduction from two to one FSAs after entry of an LCC, indicates that it is the presence of an LCC which has the dramatic impact on the average fare on the route. The presence of a second FSA has no discernible impact on the schedule of specific fares and only a minor impact on average fares.

14.4.16 Similarly, I undertook an investigation of European markets. I searched for cases where a route served by an LCC witnessed the number of FSAs drop from two to one. Using simple regression analysis, I found no statistically significant evidence that an additional FSA had any impact on route fares given the presence of an LCC.

14.4.17 I also investigated Australian evidence. First, I examined the confidential data on Qantas’
average fares in the domestic market from 1997 to 2003. This indicated that

a) the entry of Virgin Blue had an immediate and large impact in terms of lowering fares, and

b) that the exit of Ansett did not result in a sustained increase in average fares on those routes served by the LCC.

Second, I reported on statistical regression analysis of the same data set conducted by Morrison and Winston for the New Zealand Commerce Commission hearings on this matter. Using regression techniques similar to those used in the extensive U.S. literature, they found that the presence of an LCC on an Australian route had a larger impact than the presence of a 2nd FSA.

14.4.18 The Canadian, European and Australian data reinforce the U.S. results which found that it is the presence of an LCC which is the most important factor affecting average fares in airline markets. The presence or not of a 2nd FSA is of relatively minor impact.

14.4.19 **For markets in which an LCC operates or potentially operates, what is the relevance, in assessing the level of competition, of the number of airlines and market concentration?**

14.4.20 From the above evidence, it is my conclusion that it is the presence of an LCC which is the single most important factor in determining the average level of fares on an airline route. The number of carriers on a route has little or no additional impact on average prices paid. This conclusion is supported by empirical results using U.S., Australian, Canadian and European data. This is in contrast to statistical analysis for other industries (or even for this industry prior to the entry of LCCs), where the number of firms in the market, or a concentration measure, such as the Herfindahl-Hirschman index, have been determined to be important factors in market prices. In today's airline industry, the type of carrier (LCC versus a 2nd FSA) is a far more important determinant of the prices paid by consumers than a market concentration measure.

14.4.21 **In a market where there is an LCC operating on some but not all passenger routes, what is the competitive significance of the LCC’s presence in the market on routes on which it is not presently operating?**

14.4.22 There is strong evidence in the empirical economics literature that the price impact of an LCC is also felt on routes on which the LCC does not operate. A 2001 study by Morrison found that the presence of Southwest on a route reduced average fares by 46%, but if Southwest did not operate on the route itself but served both endpoints, it still had the effect of reducing average fares on a route by 33%. If Southwest served only one endpoint, it still had an impact of reducing fares by 6-13%. These impacts are higher in magnitude than the impact of the presence of additional FSAs on the route. Other studies
have indicated impacts of Southwest on routes it did not serve, including at nearby airports. More recent studies have verified that there is a general LCC effect on average prices on routes not directly served by an LCC. The phenomenon is not unique to Southwest Airlines.

14.4.23 Further evidence is found in New Zealand. Before Air New Zealand faced actual LCC entry on the domestic or Tasman routes, Air New Zealand responded to the threat and likelihood of LCC entry by dramatically changing its domestic and Tasman services (via NZ Express, and Tasman Express). As indicated in the statement of Ralph Norris, these changes dramatically reduced prices paid and caused strong market growth.

14.4.24 I thus conclude that even in markets where there is an LCC operating on some but not all passenger routes, an LCC can have dramatic impacts on average fares paid by consumers.

14.5 Network envelopment and 5th freedom carriers

14.5.1 Explain the concept of network envelopment, with particular reference to the networks of Air New Zealand and Qantas

14.5.2 The preference of some consumers, especially frequent and higher yield travellers, for services from large network airlines drives carriers to expand their networks. By enveloping the networks of their competitors, large networks can better serve their customers, and enjoy a competitive advantage over their rivals. Network envelopment is also motivated by the desire to expand the carrier’s overall traffic base and reap additional economies of traffic density.

14.5.3 Qantas and Air New Zealand are especially vulnerable to network envelopment, as their home markets are end of route destinations. They cannot use their hubs to envelop the networks of their rivals as that would involve too high a degree of circuity.

14.5.4 The challenges to the two carriers are due not only to geography, but also to access to financial capital, especially in the case of Air New Zealand. Qantas and Air New Zealand face network envelopment strategies by Emirates and Singapore (among others), both of which have access to large amounts of financial capital for fleet expansion/upgrading, continuing service improvements, etc.

14.5.5 The one important opportunity for Qantas and Air New Zealand to gain a strategic advantage is in being able to offer a unique network dimension – a comprehensive network of the combined Australia/New Zealand tourism market. Achieving this competitive advantage would be of great public benefit, as it would allow Qantas and Air New Zealand to better compete against alternative tourism destinations. Even a small shift of the massive global tourism market to a combined and enhanced Australia/New Zealand
experience will benefit many businesses and wage earners in the two nations. This network enhancement, however, can only be enabled by the proposed Alliance.

14.5.6 **What is the competitive significant of the 5th freedom carriers on the trans-Tasman, including Emirates and its expansion?**

14.5.7 I examined the operations of 5th carriers and described their economics. The trans-Tasman has characteristics which favour profitable 5th freedom operation, including the fact that many foreign carriers would have aircraft sitting at an airport in Australia or New Zealand that would be idle for many hours of the day due to time zone and curfew constraints at originating airports.

14.5.8 It was also observed that Qantas and Air New Zealand services to Europe depend on 5th freedom traffic to maintain service levels that are economically viable. This provides strong evidence that 5th freedom operations can be sustainable, even in the long term.

14.5.9 Finally, I discussed whether 5th freedom carriers act as a pricing constraint on the 3rd/4th freedom carriers. It was pointed out that even if the 3rd/4th freedom carriers (Qantas and Air New Zealand) did not lower their fares in response to entry or expansion by 5th freedom carriers, the low average fare of the latter would bring down the market average fare. Far more likely is that Qantas and Air New Zealand would respond to the 5th freedom carriers by lowering fares and/or increasing the capacity available in the lower fare classes. Evidence submitted by Qantas and Air New Zealand support this. Qantas reported specific fares it lowered in response to entry by Emirates, while Air New Zealand reported declines in its average fares from 2000 to 2003, a period which largely predated Pacific Blue.

14.6 **Current state of competition**

14.6.1 **What is the current state of competition in the markets under consideration, including by reference to barriers to entry or expansion? In the present case, how do those markets sit against the analysis of economic theory and literature and experience in the other countries referred to above?**

14.6.2 I examined the current state of competition in the markets under consideration and found the following:

- The major Australian domestic market is served by both an FSA and an LCC. The Alliance would have little or no impact on competitive conditions in this market.

- The minor domestic markets are served by a regional carrier that is a subsidiary or brand of an FSA and some have competing service from an independent regional carrier. These markets could be affected by the Alliance as the independent regional
carriers would lose some feed traffic from Air New Zealand. But they would retain feed traffic from other international carriers and have potential to obtain replacement feed traffic from the LCC, although to date such arrangements are not common.

- The trans-Tasman market is unlikely to be affected by the Alliance. First, the Auckland routes have the presence of a large number of seats from 5th freedom carriers. While these carriers may come and go, there is a stable presence of such carriers. Second, an LCC has entered four of the routes and is poised to enter others. The routes entered are notable since most do not have 5th freedom traffic. Third, there is a subsidiary of each of Qantas and Air New Zealand operating on some routes, with these subsidiaries having lower costs. Even if they remain the only carrier on a route, the evidence suggests that these subsidiary carriers will have fare and service offerings similar to that which would prevail if an LCC were present. Fourth, the evidence strongly suggests that the LCC effect is likely to spread to other routes, even those unserved at present by the LCC. The fact that Air New Zealand’s Tasman Express product is being deployed on all trans-Tasman routes supports this.

- The overseas long haul markets are relatively unaffected by the alliance as there is no route served directly by both Qantas and Air New Zealand. Any effect which could take place is due to the loss of trans-Tasman feed traffic to carriers in the alliances which will be dropped by the Qantas-Air New Zealand transaction. The presence of the 5th freedom carriers on the major trans-Tasman routes mitigates against this. The ability to utilise the LCC trans-Tasman services is another mitigating factor. There are relatively low entry barriers to 5th freedom carriers in the trans-Tasman market.

14.6.3 Outline the development of entry and attempted entry by LCCs into the Australian domestic market and the impact of that entry on existing FSAs (stating clearly your understanding of the historical facts and the sources of that understanding) and then express your view as to whether that development allows conclusions to be drawn as to the competitive interaction between FSAs and LCCs and, if so, what those conclusions are.

14.6.4 As I have indicated above, Virgin Blue has entered virtually every major Australian domestic route. This has resulted in a reduction in average fares paid by passengers, even after the 2nd FSA, Ansett, exited the market, as evidenced in Confidential Appendix Q. Pacific Blue has entered four trans-Tasman routes, and has indicated it intends to eventually serve all major trans-Tasman routes and will enter domestic New Zealand routes. In anticipation of this, Air New Zealand changed its pricing policies and reduced costs via its New Zealand Express and Tasman express products. Qantas is responding to Virgin Blue by changes to its domestic product and prices, including the launch of subsidiary carrier JetStar.

14.6.5 It is my view that the presence of an LCC requires a major response from FSAs both in
14.6.6 It is my further view that as an LCC gathers market share, the FSAs are threatened with diseconomies due to loss of traffic density and the associated economies. This must be addressed by consolidation of FSAs. If the FSAs are not able to consolidate, then the entry and expansion of LCCs will have the unintended consequence of generating an inefficiency in the FSA section of the market, by losing previous economies of traffic density. This appears to be happening in the U.S. market, where the loss of traffic density is offsetting other productivity gains induced by the LCCs onto the FSAs.

**14.7 Counterfactual**

14.7.1 *What are your views as to the likely counterfactual (or range of likely counterfactuals)?*

14.7.2 It is my opinion that the counterfactual case put forth by Qantas is reasonable and likely. Faced with growing network overlap and competition from LCC Virgin Blue and the response of Air New Zealand, the deployment of additional capacity on the Tasman and in domestic Australia is consistent with good carrier strategic management.

14.7.3 However, it is also my view that the Qantas counterfactual represents only the short term development in the market. In the medium term, it is my opinion that the most likely counterfactual will include Air New Zealand exiting the market. This is for the following reasons:

- Air New Zealand faces increasing network envelopment by Qantas, which in turn is facing envelopment on much of its entire international route system by Emirates and/or Singapore. The recent open skies bilaterals entered into by various combinations of the U.S., New Zealand, Australia, Singapore, the United Arab Emirates and others are creating the conditions for Singapore (which owns 40% of Virgin Atlantic) and Emirates, in particular, to envelop Air New Zealand and Qantas.

- Air New Zealand’s product is becoming dated, relative to the offerings of Qantas, Emirates, Singapore and others.

- Air New Zealand has not been able to consistently earn an adequate return on its long haul international route system.
• Air New Zealand will face the need for major fleet renewal. While this will become of urgent necessity in 5 or so years, the carrier will need to make a commitment prior to the point when it has to replace its fleet.

• Air New Zealand, while it has marginally improved performance (due, in large part, to recent exchange rate movements), [Confidential Information].

• This will weaken its traffic base.

• It is my opinion that the Government of New Zealand, the Kiwi shareholder, will be unlikely to invest further major capital in Air New Zealand. First, it has stated that this is its policy. Second, unlike the case in September 2001, it has exemplars in other countries of governments being willing to let their carriers fail rather than continually invest in them. Third, the magnitude of a reinvestment would amount to a staggering tax burden. The previous bail out investment of roughly NZ$1 billion amounted to an average of $250 per capita, or $1000 per tax paying family of four. Further tax burdens of this magnitude at a time when the government has so many other priorities seems to be unlikely and without a current global precedent.

• While Air New Zealand [Confidential Information] [Confidential Information].

• Thus as it faces network envelopment on its international routes and increasing fare pressures on its domestic and trans-Tasman routes from Virgin Blue, Qantas and 5th freedom carriers, Air New Zealand will reach the point where its positive cash reserves fall to the critical level which, with the lack of New Zealand law for reorganisation with bankruptcy protection, will force it to cease operations.

• There are other possible counterfactual scenarios which could see Air New Zealand survive, although barely. These would require events which are significantly less likely, such as a failure of Qantas or Virgin Blue. These are remote events for the medium term, in my opinion. Even absent aggressive envelopment by Emirates or Singapore, I believe Air New Zealand will still face network envelopment and trans-Tasman and domestic revenue erosion.

14.8 Public Benefits

14.8.1 The Applicants’ contentions in relation to the public benefits associated with the Proposed Arrangements are set out in paragraph 69 of the Applicants First Amended Statement of Facts, Contentions and Issues. Outline your views (with supporting reasons) as to whether the public benefits are plausible, supported by

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economic theory, and likely to arise solely from the Proposed Arrangements.

14.8.2 I will provide my comments on the measurement and weighting of the public benefits once I have had an opportunity to review the statement of Mr. Henry Ergas.

14.9 Constraints on prices charged by the Alliance

14.9.1 Under the Alliance, what constraints will there be on the Alliance which will dictate against raising prices or reducing output?

14.9.2 The presence of the successful and financially strong LCC, Virgin Blue, the 5th freedom carriers in the trans-Tasman, and international competition on every long haul route Qantas flies from Australia will act as effective competitive constraints on the Alliance.

- The economic literature and case studies from Canada, Europe and Australia make clear that the presence of an LCC like Virgin Blue will have a strong disciplining effect, even absent a 2nd FSA on domestic and medium haul trans-Tasman routes.

- The fifth freedom carriers operate large amounts of capacity on key trans-Tasman routes and the magnitude of their operation will also act as a constraint, although this is icing on the cake as the LCC will be the primary constraint on trans-Tasman routes.

- For domestic routes, the Alliance is unlikely to make conditions less competitive. This is not to imply that conditions on domestic routes reflect market power. To the contrary, the domestic market has already been restructured with an effective and growing LCC operating on all major routes, as well as a single FSA, and a small set of independent regional carriers.

- For long haul international routes, the Alliance will not reduce the number or nature of air carriers. Further, the removal of regulatory barriers to entry, associated with Australia’s signing of more liberal bilateral air services treaties, makes further foreign carrier entry or expansion more likely.

14.9.3 What is your opinion as to the weighting of the benefits and detriments of the alliance?

14.9.4 I will provide my views on this question after I have had an opportunity to review the statement of Mr. Henry Ergas.

14.9.5 What are the benefits or detriments in deferring any decision on the Alliance for, say, two years?

14.9.6 Deferral of the Alliance for two years will not result in Air New Zealand being in a more
favourable financial position which would allow it to renew its product and address network envelopment. It will merely make the challenges it faces more visible to the public and the government. In two years time, Virgin Blue will have entered most major trans-Tasman and domestic New Zealand routes, and Emirates and/or Singapore will have further expanded their networks to overlap Qantas and Air New Zealand. Two years time will result in the removal of any question as to the counterfactual capacity expansion by Qantas on the trans-Tasman and in domestic New Zealand as it seeks to address network envelopment. As well, it will make clear the reduced role Air New Zealand will have in trans-Tasman freight markets as it deploys the limited cargo capacity A320s.

14.9.7 There are two detriments of postponement. First, Australia will forego the considerable benefits from the Alliance, including a) cost reductions, b) sharing of these through lower fares, c) travel time savings and other network enhancement benefits consumers would have enjoyed, and d) tourism development benefits of the Alliance.

14.9.8 Second, postponement will result in further steps by Emirates and/or Singapore to envelop the network of Qantas. Without the Alliance, Qantas will divert resources and organisational focus to the development of a city presence in New Zealand and on trans-Tasman routes. With the Alliance, efforts can be focused on greater overall network enhancement, and strengthening Qantas’ hub in Singapore. Resources to develop capacity on the trans-Tasman and domestic New Zealand routes could be devoted to expanding the overall Qantas/Air New Zealand network out of Australia and New Zealand. This would be of greater benefit to the carriers, to consumers in Australia, and to Australia’s tourism and other industries.

14.9.9 What is your opinion as to whether Qantas and Air New Zealand can achieve the benefits of the Alliance by restructuring their existing business operations (e.g., Tasman Express) or through lower cost subsidiaries (e.g., JetStar and Freedom) without the Alliance?

14.9.10 The development of JetStar and Tasman Express may be necessary steps to deal with LCC encroachment with or without the Alliance. However, they are only part of the solution to the revenue erosion (from LCCs and 5th freedom carriers) and network envelopment challenges the Applicants face. JetStar and New Zealand/Tasman Express:

- will not create a basis for launching new long haul international routes to counter network overlap by stronger air carriers.

- will not enhance the network connectivity to the degree needed to obtain the dual market destination and other tourism benefits of the Alliance.

- will not allow the considerable capacity cost savings benefits on the trans-Tasman.
• will not allow capacity to be redeployed to improve the schedule spread, which would benefit consumers, as resources will still be needed to build or maintain city presence.

14.9.11 The low cost subsidiaries are important developments, and address part of the challenges facing the Applicants. But they do not have the capability of addressing the other serious challenges nor of delivering the wider range of benefits to consumers, the carriers, and Australia.
Appendix A:
Curriculum Vitae
CURRICULUM VITAE

MICHAEL WILLIAM TRETHEWAY
Last revised: 6 April 2004

BIOGRAPHICAL DATA

Date of Birth: May 22, 1952
Marital status: Married
Children: Two adult children

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EDUCATION

a) Undergraduate
1974: University of Wisconsin-Milwaukee, B.A. (Economics)

b) Graduate
1976: University of Wisconsin-Milwaukee, M.A. (Economics)
1978: University of Wisconsin-Madison, M.S. (Economics)
1981: University of Wisconsin-Madison, Ph.D. (Economics)

c) PhD - Thesis Title
"Productivity Growth and Returns to Scale in the U.S. Trunk Airline Industry, 1972-1978"

d) Academic Awards and Honours
1974-75 Wisconsin-Milwaukee, University Fellowship.
1975-76 Wisconsin-Madison, University Fellowship.
Best Paper Award - Canadian Transportation Research Forum 1986
Teaching Excellence Award - University of British Columbia, Faculty of Commerce, 1987
A.T. Kearney Inc. Best Paper Award - Transportation Research Forum 1988
Honourable Mention: Best Paper Award - Canadian Transportation Research Forum, 1989
Arne Olsen Master Teacher Award - UBC Faculty of Commerce, 1990
UBC Faculty of Commerce Leadership Award, 1994
Honorary societies: Phi Beta Kappa
                      Phi Kappa Phi
                      Phi Eta Sigma

PROFESSIONAL EMPLOYMENT RECORD

1999-present  Senior Vice President & Chief Economist, and Vice Chairman, InterVISTAS Consulting Inc., employee owned consulting firm, successor to Vancouver International Strategic Services

1997-1998  Vice President, Marketing Services, Vancouver International Strategic Services Ltd., subsidiary of the Vancouver International Airport Authority

1997-2000  Faculty, International Aviation Management Training Institute

1997-present  Adjunct Professor, University of British Columbia, Faculty of Commerce and Business Administration

1994-1996  Special Advisor to the President, Vancouver International Airport Authority

1996-1998  Faculty Member, International Aviation Management Training Institute

1988-96  Associate Professor, Faculty of Commerce and Business Administration, University of British Columbia

1983-88:  Assistant Professor, Faculty of Commerce and Business Administration, University of British Columbia

1981-83:  Senior Economist, Laurits R. Christensen Associates, Inc., Research Associate, Department of Economics, University of Wisconsin


1976-81:  Research Assistant, Economics, University of Wisconsin

1973-75:  Tutor, Department of Learning Skills, University of Wisconsin-Milwaukee
FELLOWSHIPS

1994 Visiting Fellow, Australian Bureau of Transport and Communications Economics

1994-95 Vancouver International Airport Authority, leave support

PROFESSIONAL MEMBERSHIPS

Various years

- American Economics Association
- Canadian Economics Association
- Midwest Economics Association
- Western Economics Association
- Econometric Society
- Canadian Transportation Research Forum
- Transportation Research Forum
- Transportation and Public Utilities Group, AEA
- Association for Public Policy Analysis and Management
- Air Transport Research Society

PROFESSIONAL PAPERS

A. Books and Monographs


K.D. Freeman, T.H. Oum and W.G. Waters II.


B. Chapters in Books


5. "Air Canada," in Mark C. Baetz and Paul W. Beamish (eds.) Strategic Management:
Appendix A, Page 5


C. Papers in Refereed Journals or Conference Proceedings


2. "Productivity Performance of U.S. Trunk and Local Service Airlines in the Era of


D. Selected Reports


---

1 Revised version published as a book by Centre for Transportation Studies, UBC.


10. "Logistical Marketing and Vancouver International Airport: The Need for a Strategic Approach," report prepared for Asia Pacific Committee and B.C. Department of Regional and Industrial Expansion, October 1987.


October 1991 [with T.H. Oum].


18. “The Economic Impact of a Transpacific Cargo Service” November 1994, for the Vancouver International Airport [with S. Lui].


E. Testimony Provided


24. “Statement of Michael W. Tretheway” for Comair Pty Ltd. (South Africa), testimony provided to South African Civil Aviation Tribunal, 1997.


F. Papers in Conference Proceedings


2. "Measuring and Identifying the Causes of the Productivity Performance of the Canadian


G. Papers Under Review


H. Other Publications


K. Book Reviews


L. Computer Program Papers and Reference Manuals


**COURSES TAUGHT**

Managerial Economics  
Business Statistics  
Seminar in Transportation Economics  
Air Transportation  
Urban Transportation  
Government and Business  
Business Logistics  
Logistics and Operations Management  
International Business Logistics  
Project Evaluation (Social Cost Benefit Analysis, and Environmental Impact Statements)  
Transportation in Economic Development  
Transportation Policy  
Introduction to Transportation

**SUPERVISION OF STUDENT THESES**

**Ph.D. Committees - Chairman**  
Martin Dresner - 1989

**Ph.D. Committees - Committee Member**  
Jeff McGill - 1989  
Mike Li - 1994
M.Sc. Committees - Chairman  M.Sc. Committees - Committee Member

Julie Laviolette - 1987  Todd Kurtin - 1984
Kevin Caskey - 1987  Chris Christopherson - 1984
Tony Roberts - 1994  Marie Trepannier - 1985
Saskia Roukema – 1995  Eva Busza (MA) - 1987
Guy Maclaren (MPlan) - 1991  Reagan Pratt - 1993
Heather Romank - 1995

MBA Paper Supervisor

Donna Chin - 1985  Susan Sinott - 1987  Cheryl Trepanier - 1990

UNIVERSITY SERVICE

Faculty of Commerce:
Appointment Promotion and Tenure Committee (1988/89, 1993/94)
Classroom Planning Committee (1994)
Faculty Retreat Committee (1990-chair)
Merit Committee (1988,1991)
Teaching Evaluation Review Committee (1993)
Teaching Development Fund Committee (1994-95)
Undergraduate Program Review Committee (1991/92)
Director, Summer Program in International Business in France (1992, 1993, 1994)
Director of Teaching and Curriculum Development (1992/93)
University:
  Member, President's Task Force on Networking (1985/86)
  External Review of Computing Centre (1988)
  Vice President's Committee on US Long Distance Services (1991)
  Senate Curriculum Committee (1990/91, 1991/92, 1992/93)
  University Representative, UBC Child Care Society (1988/89, 1989/90, 1990/91)
  Vice President, UBC Childcare Society (1990/91)
  Campus Classroom Planning Committee (1994)
  M. Rushton (1990)
  Khaled Alskait (1993)

OTHER SERVICE

  Director of Research, Ministerial Task Force on (Canadian) International Air Policy (1990, 1991)
  Committee Member, Ministerial Committee on Air Policy Issues (1997)
  Co-Director, Canadian Network on Productivity (1988/89)
  Member, Minister of Transport Advisory Committee on Airport Transfers (1988-91)
  Member, user funding committee, Federal Environmental Assessment Review Office (1990)
  Transportation subcommittee, Vancouver Planning Commission (1987)
  Productivity Committee, Association of American Railroads
  Vancouver Board of Trade: Airline Pre-Clearance Task Force (1987)
  Vancouver Gateway Council (1994)
  Associate Editor, Logistics and Transportation Review, (1987-present)
  Advisory Editor, Quarterly Journal of Economics and Business (1991-present)
  Advisory Editor, Journal of Air Transport Management (1994-present)
  World Airline Regulation Monitor Committee, International Air Transport Association

Referee for the following academic journals:
  Air Policy and Management
  American Economic Review
  Bell/Rand Journal of Economics
  Canadian Journal of Economics
  Canadian Public Policy
  Economic Development and Cultural Change
  International Journal of Transportation Economics
  Journal of Air Transport Management
  Journal of Econometrics
  Journal of Economic Education
Reviewer for following publishers:
- MIT Press
- North Holland Publishers
- Transport Research Centre, Australia
- Irwin Books
- McGraw Hill
- Ashgate Publishing

Reviewer for the following funding agencies:
- Earhart Foundation
- Federal Environmental Assessment Review Panel
- National Research Council/Transportation Research Board
- Natural Sciences and Engineering Research Council of Canada
- Social Science and Humanities Research Council of Canada

Other
- Referee for World Conference on Transportation Research
- Reviewer of tenure and promotion cases at other universities
- Numerous interviews to radio, television and print journalists
  (long-term average of 40 per year, 1983-1996)

Visiting Lectures at Other Universities
- Northwestern University
- Ohio State University – Distinguished Lecturer Series
- University of Oregon
- Pennsylvania State University
Simon Fraser University
University of Alberta
University of Calgary
University of Oregon
University of Toronto
University of Western Ontario
University of Wisconsin
Washington State University
Wilfred Laurier University

**Short Course Instruction at Other Universities**

- Shanghai Jiaotung University
- Sian Jiaotung University
- Nankai University
- Universite Canadienne en France

**Short Courses Taught for International Management Training Institute**

- Hong Kong
- Madrid
- Montreal
- Penang Malaysia
- Rio de Janiero
- Vancouver
Appendix B:
List of documents provided by counsel
List of Documents Received

forthcoming
Appendix C:
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Appendix D:
List of documents obtained on my own initiative
List of documents obtained on my own initiative\textsuperscript{159}

Air Canada, *Annual reports*, various issues.


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Centre for Asia Pacific Aviation, *Peanuts!, the weekly international monitor of low cost airline news and strategic issues*, various issues, 2004.

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Jet Blue, *Annual reports*, various years.

Lundqvist fleet database, available through BACK Aviation Solutions.

NECG (2003), “Qantas and British Airways Joint Services Agreement: A report by NECG on economic issues relating to the pending application for re-authorisation of the Joint Services Agreement between Qantas and British Airways,” May.

Ryanair, *Annual reports*, various issues.

Singapore Airlines, *Annual reports*, various years.

Southwest Airlines, *Annual reports*, various years.

\textsuperscript{159} Does not include publications listed in Appendix C.


Appendix E: The Global Emergence of the Low Cost Carrier

Figure 8: Map With Selected Low Cost Carriers
Appendix F: Comparison of selected LCC vs. FSA growth rates

Figure 9: Growth rates of Southwest vs Other U.S. Majors

Index of Southwest RPMs vs. Other U.S. Majors

Note: Other U.S. Major air carriers include: American Airlines, Continental Airlines, Delta Airlines, Northwest Airlines, United Airlines and U.S. Airways.
Figure 10: Growth Rates of Ryanair Versus AEA Airlines

Index of Ryanair RPMs vs. Association of European Airlines (AEA)

Note: AEA (Association of European Airlines) include the following airlines: Adria Airways, Aer Lingus, Air France, Air Malta, Icelandair, Jugoslav Airlines, KLM, Lufthansa, Luxair, Malev Hungarian Airlines, Olympic Airways, Sabena, SAS, Spanair, Swissair, TAP Air Portugal, Tarom - Romanian Air Trans and Turkish Airlines.
Appendix G:
Selected LCC Aircraft Orders
Figure 11: Summary of Low Cost Carrier Aircraft Options and Orders

<table>
<thead>
<tr>
<th>Airline Name</th>
<th>Aircraft Type</th>
<th>Options</th>
<th>Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Tran Airways</td>
<td>Boeing 717-200</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Boeing 737-700</td>
<td>50</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
<td><strong>37</strong></td>
</tr>
<tr>
<td>EasyJet</td>
<td>Airbus A319-100</td>
<td>120</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Boeing 737-700</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>123</strong></td>
</tr>
<tr>
<td>EasyJet Switzerland</td>
<td>Airbus A319-100</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Eurowings</td>
<td>Airbus A319-100</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Frontier Airlines [CO-USA]</td>
<td>Airbus A318-100</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Airbus A319-100</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td>JetBlue Airways</td>
<td>Airbus A320-200</td>
<td>50</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>Embraer 190 (ERJ 190-100)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>205</strong></td>
</tr>
<tr>
<td>Ryanair</td>
<td>Boeing 737-800</td>
<td>125</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>125</strong></td>
<td><strong>119</strong></td>
</tr>
<tr>
<td>Southwest Airlines</td>
<td>Boeing 737-700</td>
<td>269</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>269</strong></td>
<td><strong>123</strong></td>
</tr>
<tr>
<td>Virgin Blue Airlines</td>
<td>Boeing 737-800</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>WestJet</td>
<td>Boeing 737-700</td>
<td>44</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
<td><strong>21</strong></td>
</tr>
<tr>
<td><strong>Low Cost Carriers Total</strong></td>
<td></td>
<td><strong>808</strong></td>
<td><strong>667</strong></td>
</tr>
</tbody>
</table>

Source: BACK Aviation Solutions/Lundkvist Fleet Database.
Note: Options and orders include aircraft that have not been delivered as of July 5th, 2003 and additional orders/options placed between July 2003 and March 2004. Southwest options include 52 options and 217 purchase rights as of 29 January 2004, as indicated in its 10K report.
Appendix H:
Market Capitalisations of Selected Airlines

Table 11:  Market Capitalisations of Selected Airlines

<table>
<thead>
<tr>
<th>Air Carrier</th>
<th>Market Capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Europe</strong></td>
<td></td>
</tr>
<tr>
<td>US$ million</td>
<td></td>
</tr>
<tr>
<td>British Airways</td>
<td>$5,539</td>
</tr>
<tr>
<td>Lufthansa</td>
<td>$5,495</td>
</tr>
<tr>
<td>Ryanair</td>
<td>$4,752</td>
</tr>
<tr>
<td>EasyJet</td>
<td>$2,123</td>
</tr>
<tr>
<td>KLM</td>
<td>$924</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td></td>
</tr>
<tr>
<td>US$ million</td>
<td></td>
</tr>
<tr>
<td>WestJet</td>
<td>$1,516</td>
</tr>
<tr>
<td>Air Canada</td>
<td>$68 under bankruptcy protection</td>
</tr>
<tr>
<td><strong>US</strong></td>
<td></td>
</tr>
<tr>
<td>US$ million</td>
<td></td>
</tr>
<tr>
<td>Southwest</td>
<td>$10,609</td>
</tr>
<tr>
<td>Jet Blue</td>
<td>$2,201</td>
</tr>
<tr>
<td>American</td>
<td>$1,987</td>
</tr>
<tr>
<td>Delta</td>
<td>$954</td>
</tr>
<tr>
<td>Air Tran</td>
<td>$932</td>
</tr>
<tr>
<td>Continental</td>
<td>$768</td>
</tr>
<tr>
<td>Alaska</td>
<td>$640</td>
</tr>
<tr>
<td>Frontier</td>
<td>$337</td>
</tr>
<tr>
<td>United</td>
<td>$254 under bankruptcy protection</td>
</tr>
</tbody>
</table>
## Market Capitalisations
### As of 16 March 2004

<table>
<thead>
<tr>
<th>Air Carrier</th>
<th>Market Capitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australia/New Zealand</strong></td>
<td></td>
</tr>
<tr>
<td>Qantas</td>
<td>$4,258</td>
</tr>
<tr>
<td>Virgin Blue*</td>
<td>$1,942</td>
</tr>
<tr>
<td>Air New Zealand</td>
<td>$819</td>
</tr>
</tbody>
</table>

Source: Most stock exchange web sites provide market capitalisations. For Australia/new Zealand, share price was multiplied into shares outstanding from annual reports. For Virgin Blue shares outstanding were based on its 2003 Prospectus.
Appendix I

*intentionally blank*

This appendix does not exist to avoid confusion between the letter I and roman numeral I.
Appendix J: Selected LCC Actual and Break-even Load Factors

Sources: Carrier Annual Reports, InterVISTAS Consulting Inc. computations
Figure 12: Ryanair Breakeven and Actual Load Factors

Figure 13: Southwest Breakeven and Actual Load Factors

10 point gap until 2001
Figure 14: WestJet Breakeven and Actual Load Factors

Figure 15: JetBlue Breakeven and Actual Load Factors

8 point gap
Figure 16: Virgin Blue Breakeven and Actual Load Factors

![Virgin Blue Breakeven and Actual Load Factors]

Note: 2001 data is for the 7 months ended March 2001 and 2004 data is for the 6 months ended September 2003. 2002 and 2003 data is for the 12 months ended March 2002 and 2003 respectively.

Figure 17: U.S. FSA Breakeven and Actual Load Factors

![US Major Carriers (exclude SW)]

Source: Aviation Daily 27 Feb 2004
Appendix K:
Review of the Empirical Economics Literature on the Effect of Market Structure on Airline Prices
15.1 **Hub Dominance Premium**

15.1.1 Hub-and-spoke systems evolved in the U.S. immediately following deregulation, as a way for carriers to increase revenues by providing better connections and frequencies for travellers.

15.1.2 In many instances, the hub airports became highly concentrated, with one or two airlines dominating the airport. This led to concerns that this concentration could act as a barrier to entry, allowing the dominating airline (or airlines) to raise fares on flights to and from the hub, commonly referred to as the hub premium. It was generally believed that such a premium would apply mainly to trips originating or terminating at the hub. Passenger trips connecting through a hub benefit from competition via other hubs, so any particular hub airline would be unable to charge a premium on connecting traffic.

15.1.3 **Hub Premiums**

Early research into the area of hub premiums took the form of comparisons of fares before and after a merger which resulted in airport hub dominance, or comparisons of fares at hub airports with those at non-hub airports. This led to a series of empirical papers which researched the existence and degree of any hub dominance premium.

15.1.4 **Huston and Butler (1988)**

One of the first studies in this area was by Huston and Butler (1988), which examined the impact of the 1986 merger of TWA and Ozark on service and fares at their shared hub in St. Louis. They used very simple analysis which compared fares and service levels before and after the merger and found that while connectivity improved (i.e., the number of destinations served increased), fares increased. Fares to St. Louis increased by 13-46% while fares through St. Louis (connecting traffic) increased by only 6-19%. The lower fare increases on connecting flights was put down to competition from other hubs for connecting traffic. Their analysis made no attempt to control for various factors such as changes in route distance (discussed further below).

15.1.5 **U.S. General Accounting Office (1990)**

Another early study to quantify the hub premium was a 1990 study by the U.S. General Account Office. The study compared yields (average fare per mile) for trips originating at 15 U.S. hub airports dominated by one or two carriers with those originating at 38 unconcentrated airports. This simple analysis concluded that yields at hub airports

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160 The paper also examined the impact of the Northwest/Republic merger on services levels at their hubs in Minneapolis St. Paul and Detroit but not fares.
were 27% higher.\textsuperscript{161} A hub airport was considered dominated if one airline accounted for at least 60% of all enplanements or if two carriers accounted for at least 80% of enplanements.

15.1.6 \textit{U.S. Department of Transportation (1990)}

The U.S. Department of Transportation (DOT) carried out a similar study of hub premiums by comparing yields at concentrated and unconcentrated airports. In the analysis, an attempt was made to control for distance by comparing routes of similar distance. Using this methodology they estimated an average hub premium of 18.7%.

15.1.7 However, as was pointed out in subsequent research, these early studies made little attempt to adjust for other factors which impact yield, such as route distance, traffic mix, carrier identity, etc. For example, hub airports may have a higher proportion of business travellers, who typically pay higher fares, than non-hub airports as hubs tend to be based near major cities.\textsuperscript{162} Thus, any observed hub premium may simply be due to the characteristics of travel demand at hub cities, rather than to market dominance.

15.1.8 One factor of particular importance was the \textit{stage length} of a route. Substantial costs are incurred in getting an aircraft off the ground to cruising altitude, and then getting it back down again. These are due to the characteristics of getting a heavy object into the air, as well as due to costs such as landing fees which do not vary with the stage length of a flight. Short routes will thus have higher costs per mile than longer routes, which can spread these fixed costs over more kilometres.\textsuperscript{163} This is relevant for measuring any hub premium since routes from hubs are shorter than non-hub routes. The latter will often include many long transcontinental flights. Hubs, on the other hand, are located more centrally, and, at least in the U.S., are significantly shorter. Thus, any observed hub premium may simply be a result of the shorter route distances, rather than due to exploiting market dominance.\textsuperscript{164}

15.1.9 \textit{Borenstein (1989) – widely cited early study}

One of the first studies to attempt to account for these factors which may influence the finding of hub dominance was Borenstein (1989). \textit{This is a widely cited paper and it found a substantially lower hub premium.} Borenstein estimated an econometric model

\textsuperscript{161} Like much of the research reported here, the GAO study makes use of Databank 1A (DB1A) of the U.S. Department of Transportation \textit{Origin and Destination Survey}. The DB1A is a random 10\% sample of all tickets that originate in the U.S. on domestic carriers.

\textsuperscript{162} It has been argued that the higher business fares are, in part, a result of a higher cost of provision for these travellers. Business travellers demand high frequency, connectivity and last-minute availability, all of which imposes a cost on the airline.

\textsuperscript{163} The costs are fixed in the sense that they do not vary with the distance of the flight.

\textsuperscript{164} As will be seen below, Morrison and Winston (1995) found that a 33\% hub premium was reduced by 56\% simply by controlling for the length of the route.
which related the median route fare charged by each airline to a number of operational, cost and market factors including route and airport concentration levels. Using cross-sectional DB1A data from Q3 1987, the estimation found that there was a statistically significant impact of airport concentration on fare, such that each 1% increase in origin airport market share resulted in a 0.33% increase in fares. Borenstein described the findings as: a carrier which has a market share of 50% at both endpoints of a route is able to charge fares 6% higher than a carrier with a 10% share at each endpoint. Borenstein points out that, although there is evidence of hub premium, hubs provide many benefits to consumers which should also be taken into account, such as higher frequencies, easier connections and more non-stop flights.

15.1.10 Borenstein (1990)
In a later paper, Borenstein examined the impact of the Northwest/Republic merger on fares at Minneapolis St. Paul and the impact of the TWA/Ozark merger on fares at St. Louis (Borenstein, 1990). Both mergers occurred in 1986. The analysis took the form of a comparison of fares on routes from merger-affected hubs with average industry fare on similar distance routes. The analysis indicated that, following the merger, fares at Minneapolis St. Paul had increased 9.5% on average relative to comparable routes. Fare increases were observed even on routes where there was competition from a third carrier. The evidence from St. Louis was less conclusive: fares on some routes increased while on others it decreased, with zero overall impact. The paper also examined service levels and market share, and in both mergers found that flight frequencies decreased and market share increased (by comparing market share on flights from the hub with share on flights to the hub). This paper employed a less sophisticated approach than Borenstein’s previous paper but it did control for distance.

15.1.11 SH&E (1989)
Another early paper to examine the impact of airport concentration on airline pricing was carried out by Simat, Helliesen and Eichner Inc. (later SH&E) in 1989 for the Air Transport Association. The study compared fares at hub and non-hub cities and found that hub fares were 2.2% to 3.8% above non-hub fares – a small difference. The study then reports a

165 Explanatory variables included route distance, load factor, aircraft seats, CASM (cost per available seat mile), frequency, average number of on-plane and change-plane stops, variables relating to the market share and Herfindahl-Hirschman index of market concentration at the endpoint airports and on the route itself, a measure of the tourism orientation of endpoint cities (a proxy for the tourism mix of the route) and a dummy indicating a constrained airport.

166 In statistical estimation, a distinction is made between time series data, cross sectional data and panel data. Cross sectional data has data points all from the same year, but from different routes. The statistical analysis is based on differences between routes. Time series data may take a single route and has data points from different time periods (different quarters in the case of DB1 data). The statistical analysis is based on differences within a route, over time. A panel data consists of a cross section of routes over time. Its statistical analysis can use total variation, both between and within routes. There are, however, important subtleties in how inference should be made for between, within and total variation.
stepwise regression analysis of the factors determining fares using data from 30 hub and 30 non-hub airports. The dependent variable (the ratio of the airport’s average fare to the comparable national average) was regressed against the ratio of seats to local passengers, airport load factor, market share of LCC at the airport (e.g., Southwest), ratio of outbound tickets to inbound (measure of business/leisure split – more inbound than outbound implies a tourism destination), frequency and leading carrier airport market share. The results of the regression analysis supported the initial comparative analysis, finding that the leading carrier’s market share had only a slight impact on fares.

15.1.12 Abunassar & Koford (1994)
The technical specification of the SH&E regression analysis was criticised in a later paper by Abunassar and Koford (1994), due to the absence of certain variables and citing evidence of multicolinearity. Abunassar and Koford estimated a revised version of the regression model, correcting for these problems (most significantly, including a Herfindahl-Hirschman index of airport concentration and removing the leading carrier airport market share variable). The revised estimation indicated that dominance of an airport resulted in a 10% increase in fares relative to an unconcentrated airport.

15.1.13 Dresner & Windle (1992)
An alternative form of analysis was carried out by Dresner and Windle in 1992. The analysis compared yields on flights to a hub with yields on flights from a hub. E.g., yields for Airport X → Airport Y versus yields for Y → X, where airport X is a dominated airport. The contention of the paper was that if market power was being exercised at the hub, yields on the flights from the hub (X → Y) would be higher than yields to the hub (Y → X). A regression analysis was carried out with the difference in directional yields on routes (e.g., average yield X → Y minus average yield Y → X) as the dependent variable. The explanatory variables included the difference in airport market share (market share at X minus market share at Y, where market share is defined as the % of enplanements operated by the carrier), difference in directional yields of competitor carriers and city specific dummy variables. The analysis also used DB1A data from Q3 1987 (i.e., cross-sectional) on 513 routes from the 30 largest U.S. airports. The results of the analysis indicated the presence of a small hub premium, implying that a 1% higher market share at the originating airport is associated with a 0.01% higher yield. Put another way, a 28% higher airport market share at the origin airport leads to a 1-2% premium on yields. The authors characterised this premium as small but significant but postulated that it was due to the higher proportion of business travellers at hub airports.

15.1.14 Dresner and Windle (1993)
Dresner and Windle carried out further analysis of the hub premium in a paper published in

167 Dummy variables for specific cities attempt to control for factors unique to certain cities. Las Vegas, for example is a different market with different base traffic than a city such as Detroit.
1993. Specifically, the paper examined the difference in yields between ‘monopoly’ and duopoly airports. The authors developed a model of the indirect effect of hub dominance, which postulated that hub monopoly prices were higher not so much because a single carrier had a large share of emplanements but because this domination inevitably lead to domination of routes into and out of the monopoly hub. Hub domination leads to route domination which leads to higher yields. A two stage model was developed where yield on a route was a function of the number of carriers on a route, traffic density, distance and city specific dummies, and the number of carriers on a route was a function of route density and a duopoly dummy. The model was also estimated using DB1A data from Q3 1987 for three monopoly hubs and four duopoly hubs. The findings indicated that there was a 2-3% fare premium at monopoly hubs relative to duopoly hubs. The model demonstrated that hub competition contributes to competition on a given route which indirectly leads to lower yields. Due to the nature of the analysis, the research did not provide any insight into the price difference between concentrated and unconcentrated airports, just the difference between monopoly and duopoly dominance.

15.1.15 S. Morrison and Winston (1995)

More recent research on the hub premium has focussed on passenger mix - the proportion of business versus leisure travellers – among other factors. In their book, The Evolution of the Airline Industry (1995), Morrison and Winston argue that previous analysis has not fully accounted for traffic mix, frequent flyer tickets, carrier identity and connecting services and, in some cases, distance. Specifically, they cited:

- Traffic mix – hubs may have greater proportions of business travellers (who generally pay higher fares) than non-hubs as hubs tend to based near large cities.

- Frequent flyer tickets – these have been excluded from previous analysis but in fact should be included, as frequent flyer travel represents a discount on travel. Typically, frequent flyer tickets tend to be more concentrated at hub airports so excluding them from analysis biases the average fares of hub airports upwards relative to non-hub fares.

- Carrier identity – Delta may charge higher fares at its hub in Atlanta because it charges higher fares at all the airports it serves.168

- Preference for non-stop service – Hubs tend to have a greater proportion of non-stop trips than non-hubs. Since trips requiring a connection are less attractive to travellers, they are likely to have a lower fare than a non-stop flight.

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168 The carrier identity effect may represent that some airlines provide higher service levels and are able to earn a premium for these service levels on all routes, not merely routes at the hub. Higher service levels may be due to higher flight on-time performance, higher frequency, better in-flight or on the ground service levels, etc.
To illustrate their point, the authors compared the hub premium estimated using the methodology used in the 1990 General Account Office study with one that controlled for the factors above. Once again, using DB1A panel data from Q4 1978 to Q4 1993, a comparison was made between yields at 15 hub airports and a control group of 27 unconcentrated (non-hub) airports. Average yield was calculated for sub-categories of routes from the control group airports. The hub premium was calculated as the percentage by which actual revenue at the concentrated airport exceeded the revenue calculated using the yield from the control group.

Through this analysis, the hub premium was estimated to be 5.2% in 1993, having ranged from 4% to 10% between 1978 and 1993. Applying the GAO’s methodology (a straight comparison of hub and non-hub fares with no adjustment for the factors above), the hub premium was calculated using the GAO methodology to be 33.4% in 1993. The authors explain that the 28.2 percentage point difference between the GAO’s estimate and their own is broken down as follows:

- 18.6% was due to distance and plane change effects;
- 4.6% was due to airline-specific effects;
- 2.5% was due to the frequent flyer adjustment;
- 2.5% was due to the exclusion of nine tourism heavy airports from the control group (effectively adjusting for traffic mix by comparing business hub airports with business non-hub airports).

S. Morrison and Winston contend that the hub premium is much smaller than previously reported and even with the premium, fares are substantially below the levels that occurred before deregulation.

Morrison subsequently repeated the need to control for other factors when assessing the hub premium in testimony given to the Committee on the Judiciary, United States House of Representatives (1997). Again, using DB1A data from 1996, Morrison compared the average fare at 11 concentrated U.S. airports with the average fare across all U.S. airports. This simple comparison produced a hub premium estimate of 22%. However, simply by removing airports which were served by Southwest from the control group, the fares at the concentrated airports were found to be 6% lower than the remaining airports.

The routes were broken down into 100-mile distance bands, by non-stop versus connecting flights, and by airline. In addition, the average yield calculation included frequent flyer tickets with the yield set to zero. They then calculated what the fare would be for each route from a concentrated airport by using the average yield from the comparable route type from the unconcentrated control group.
15.1.20 **Morrison argues that the analysis of the hub premium is actually capturing a Southwest effect (in addition to other factors) rather than a significant abuse of market power by dominant carriers.**

15.1.21 **U.S. DOT (2001)**

The U.S. DOT (2001) has criticised this interpretation, arguing that the analysis shows that dominant carriers will extract a hub premium unless constrained by competition from an LCC such as Southwest.


This paper carried out an analysis similar to the 1995 work of Morrison and Winston, using proprietary ticket data from Northwest Airlines for the period 1996 to 1998, which controlled for distance, frequent flyer tickets and traffic mix. The analysis compared fares paid by passengers originating at Northwest’s hubs (Detroit, Minneapolis St. Paul, Memphis) with fares paid by passengers connecting at these hubs. The authors contend that connecting passengers would not be subject to the same hub premium due to competition from other hubs (an argument made by many other researchers). Frequent flyer tickets were included in the fare average calculations, with the fare set to zero. (Frequent flyer reward tickets accounted for 9.1% of seats on Northwest’s network in 1998.) Traffic mix was accounted for by carrying out separate analysis for different fare groups – unrestricted (business orientated) and restricted (leisure orientated). For each fare group, simple regression models were estimated relating average route fare to route distance for hub originating and connecting routes, to account for distance.

15.1.23 **The analysis determined a hub premium of 1-3% for unrestricted fares and a hub discount of –4% for restricted fares.** The overall hub “premium” was –4%. The authors conclude that the hub premium is a “myth”. They argue that Northwest is fairly representative of the whole network carrier industry so the results are applicable industry-wide. The negative “premium” was put down to the inferior nature of a connecting flight versus a direct flight, which results in a discount on connecting flights.

15.1.24 This analysis has been subject to criticism. For example, the authors treat passengers connecting from one of Northwest’s regional partners as hub originating passengers, which may distort the average fares estimates.

15.1.25 Note that it could be argued that the connecting discount may be disguising the hub premium. E.g., if the connecting discount is –9% and the hub premium is 5%, then the analysis would net out to –4%.

15.1.26 **Lee and Luengo-Prado (2003)**

Another research paper to control for traffic mix was by Lee and Luengo-Prado (2003). Again, using DB1A data from 2000, they estimated a regression model relating average route yield for each carrier to distance, traffic density, route market share of the carrier,
presence of an LCC and a dummy indicating whether either endpoint was a major hub for the carrier. Separate models were estimated for premium fares (unrestricted economy, business and first) and coach fares (restricted) to control for traffic mix. The analysis did not incorporate frequent flyer tickets. The analysis was able to estimate hub premiums for individual hub airports. The premiums ranged from −5% at Miami to 31% at Newark. The overall average premium for coach fares was 12%, while for premium fares it was 13%. The analysis also found that the presence of an LCC on a route reduced coach fares by 14% and premium fares by 6%.

15.1.27 U.S. DOT (2001)
The U.S. DOT maintains that there is a substantial and problematic hub premium (it refers to hubs as “pockets of pain”), and has rejected many of the arguments to the contrary. In a 2001 paper, the DOT argued that passenger mix or the “Southwest effect” are not factors which explain away the hub premium but rather, are symptomatic of the problem. The main contention of the paper is that average fares have consistently declined at major hubs following entry by an LCC such as Southwest, indicating that the hub carrier was exploiting its monopoly position prior to the LCC’s arrival.

15.1.28 Conclusions
The issue of the hub premium has been controversial, but some conclusions can be drawn. First, early studies estimated substantial premiums at hubs but failed to control for other factors such as traffic mix, frequent flyer reward tickets, low cost carriers (the “Southwest effect”) and distance. Second, more recent studies have attempted to control for these factors and have revealed a much smaller premium. In some cases the ‘premium’ has been found to be negative. Third, investigation of hub premiums revealed that another factor was influencing fares paid. That is whether or not a low cost carrier such as Southwest is present in the market. While this was of secondary interest in the development of the literature, it indicated that the LCC effect was large.

15.1.29 The following table lists the key papers in the debate on hub premiums.

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huston and Butler (1988)</td>
<td>Compared fares at St. Louis before and after the 1986 TWA/Ozark merger. Did not control for any exogenous factors.</td>
<td>Fares to St. Louis increased 13-46% while fares through St. Louis increased by 6-19%.</td>
</tr>
<tr>
<td>U.S. General Accounting</td>
<td>Compared yields at concentrated and</td>
<td>Estimated an average yield premium of</td>
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170 Other operational and market related explanatory variables were also included.
<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
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<tbody>
<tr>
<td>Office (1990)</td>
<td>unconcentrated airports. Did not control for any exogenous factors.</td>
<td>27% at concentrated airports relative to unconcentrated airports.</td>
</tr>
<tr>
<td>U.S. Department of Transportation (1990)</td>
<td>Compared yields at concentrated and unconcentrated airports. Controlled for distance by comparing routes of similar distance.</td>
<td>Estimated a hub premium of 18.7%.</td>
</tr>
<tr>
<td>Borenstein (1989)</td>
<td>Estimated yields on U.S. domestic routes as a function of a number of variables including airport market share, distance, cost and market factors. Controlled for distance, cost, frequency, connections and, to some extent, traffic mix.</td>
<td>Results imply that a carrier which has a market share of 50% at both endpoints of a route is able to charge fares 6% higher than a carrier with 10% at each endpoint.</td>
</tr>
<tr>
<td>Borenstein (1990)</td>
<td>Examined fares at Minneapolis St. Paul following the Northwest/Republic merger, and at St. Louis following the TWA/Ozark merger. Compared fares at these hubs against the national average. Controlled for distance.</td>
<td>Found a 9.5% average increase in fares at Minneapolis St. Paul following the merger. The evidence from St. Louis was less conclusive, showing no overall increase in fares.</td>
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<tr>
<td>Simat, Helliesen and Eichner (1989) for the Air Transportation Association</td>
<td>Compared hub and non-hub fares, and estimated a regression model relating fares to a number of factors including airport market share. Controlled for distance, frequency, cost and traffic mix.</td>
<td>Average fares at the hub airports were 2.2% to 3.8% higher than at non-hub airports.</td>
</tr>
<tr>
<td>Abunassar and Koford (1994)</td>
<td>Re-estimated the Simat, Helliesen and Eichner regression model, using an alternative specification. Controlled for distance, frequency, cost and traffic mix.</td>
<td>Results indicated monopoly dominance of an airport resulted in a 10% increase in fares relative to an unconcentrated airport.</td>
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<tr>
<td>Dresner and Windle (1992)</td>
<td>Compared yields on flight from a hub to yields on flights to a hub. Estimated a regression model relating the difference in direction yields to various factors including market share. Controlled for distance and, to some extent, traffic mix.</td>
<td>A 28% higher airport market share at the origin airport leads to a 1-2% premium on yields.</td>
</tr>
<tr>
<td>Dresner and Windle (1993)</td>
<td>Examined the difference in yields between monopoly and duopoly airports. Estimated yields as a function of route density, number of carriers on the route and distance.</td>
<td>The findings indicated that there was 2-3% fare premium at monopoly hubs relative to duopoly hubs.</td>
</tr>
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</table>
### Study Method Key Findings

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Morrison and Winston</td>
<td>Calculated average yields for sub-categories of routes broken down by</td>
<td>Estimated an average hub premium of</td>
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<tr>
<td>(1995)</td>
<td>distance, non-stop versus connecting, and by carrier.</td>
<td>5.2%</td>
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<tr>
<td></td>
<td>Controlled for distance, frequent flyer tickets, connections, traffic</td>
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<td>mix and carrier identity.</td>
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<tr>
<td>S. Morrison (1997)</td>
<td>Compared fares at hub airports with those at non-hub airports without</td>
<td>Found that fares at hub airports were</td>
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<td></td>
<td>service by Southwest.</td>
<td>6% below those at non-hub airports</td>
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<td></td>
<td>Controlled for carrier identity.</td>
<td>without Southwest service.</td>
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<tr>
<td>Gordon and Jenkins (2000)</td>
<td>Used proprietary data from Northwest to compare fares for passengers</td>
<td>Estimated a hub premium of –4%; i.e.,</td>
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<td></td>
<td>originating at hub airports with fares for passengers connecting at</td>
<td>there was no premium.</td>
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<td>the hubs.</td>
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<td></td>
<td>Controlled for distance, frequent flyer tickets and traffic mix.</td>
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<tr>
<td>Lee and Luengo-Prado (2003)</td>
<td>Estimated a regression model relating average route yield to distance,</td>
<td>Estimated a hub premium of 12-13%.</td>
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<tr>
<td></td>
<td>market share, presence of an LCC and other factors.</td>
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<tr>
<td></td>
<td>Controlled for distance, traffic mix and carrier identity.</td>
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### 15.2 Other Hub Related Studies

15.2.1 In addition to research into the hub premium, a number of studies have examined aspects of the hub phenomenon. Two are reviewed here.

15.2.2 *Kling, Grimm and Corsi (1991)*

This paper examined the strategies that entrant airlines can use to successfully compete at dominated hubs. Using DB1A data for Q3 1987, the authors estimated a regression model which related average carrier route yield to a series of variables designed to reflect potential differences in entry strategies. The analysis was to test the validity of these hypothesised strategies.\(^{171}\) For example, one of the strategies examined relates to the

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\(^{171}\) Other variables relating to cost were also included in the regression. Each observation was a route operated by a challenging airline to/from an airport dominated by another airline.
size of challenger carrier (which was represented by the total domestic revenue of that airline in Q3 1987) – with the hypothesis to be tested being that larger airlines are better able to compete when faced with entry.

15.2.3 The strategies they examined and the findings obtained are summarised below:

15.2.4 **Hypotheses: Size of an entrant matters.** Does size of an entrant/challenger make it better able to compete against a dominant airline?  
**Evidence: No.** No evidence was found for this hypothesis. Small carriers such as Southwest (which was relatively small at the time of the research) can do as well as American or United.

15.2.5 **Hypothesis: Entrants will do better against a dominant carrier that is small.** The smaller the size and financial strength of the dominant airlines, the better the competitor will do.  
**Evidence: No.** The opposite was found. Small carriers have lower costs and will defend more aggressively.

15.2.6 **Hypothesis: Small market share of the dominant airline improves prospects of an entrant.** The smaller the market share of the dominant airline, the better the competitor will do.  
**Evidence: No.** The opposite was found. Challenger airlines did better where the dominant carrier had a higher market share. The reason given was that a strongly dominant airline is more secure, and thus will not fight for small amounts of market share.

15.2.7 **Hypothesis: Large market share of entrant airline means it will do better.** The larger the market share of the challenger at the dominated airport, the better it will do.  
**Evidence: Yes.** The analysis showed that airlines also operating a hub, albeit a smaller one, from the same airport as the dominant airline did better.

15.2.8 **Hypothesis: Challengers do better in larger markets.** The larger the population of the city where the dominated airport is located, the better the challenger will do.  
**Evidence: Weak support.** There was statistically weak evidence to support this.

15.2.9 **Hypothesis: Higher market share for challenger improves its success.** The greater a challenger’s market share at the destination airport, the greater the performance of the challenger from the dominated airport.  
**Evidence: Yes.** Statistically strong evidence to support this, particularly if the destination airport is the challenger’s hub.

15.2.10 **Hypothesis: Focus on routes not served by dominant airline.** The challenging airline will do better on routes from the dominated airport on which the dominant airline does not operate (no direct competition).  
**Evidence: Yes.** Some small airlines concentrating on routes unserved by the dominant
airline achieved high yields.

15.2.11 **Hypothesis:** Service to a slot constrained airport improves challengers prospects.  
A challenger operating a route to a slot-constrained airport will do better than to an unconstrained airport. This of course is dependent on the challenger having obtained access to needed slots.  
**Evidence:** Yes. A challenger airline does better (conditional on having slots) from a slot constrained airport.

15.2.12 **Hypothesis:** Fewer competitors improves challenger success. The less competition on a route (as measured by the Herfindahl-Hirschman index) the better the challenger will do.  
**Evidence:** Weak support. There is statistically weak evidence to support this.

15.2.13 **Hypothesis:** Higher frequency improves success. The higher the challenger’s frequency on a route, the greater market share it will achieve.  
**Evidence:** Yes. The analysis supports this strategy. On routes where the challenger’s frequency was higher than the dominant airline by at least one flight per day, its yields were 10% higher than the dominant airline’s. On routes where the challenger’s frequency was at least one flight per day less than the dominant airline, its yields were 21% below the dominant airline’s.

15.2.14 **Brueckner, Dyer and Spiller (1992)**  
This paper examined the impact of network characteristics on fares on individual routes. The authors postulated that increases in traffic on the spokes of a network reduces fares in the markets served due to economies of scale. Similarly, a network connecting large cities will have lower fares than a similarly sized network serving smaller cities (all else being equal). This hypothesis was tested using analysis of DB1A data from 1985. Fare was regressed against variables representing the number of cities connected by the network, city population, competition on the route, distance, income, tourism potential, airport concentration at each endpoint, network traffic volumes and airline specific dummies. The dataset included only fares on 4-segment (i.e., connecting) flights where the start and end points are not hubs. The reason being that on these routes no carrier has market power at the start/end point, so any potential dominance effect would not override the density effect.

15.2.15 The results indicated that increases in the size of network, whether it be the number of destinations served or per route traffic volumes, were accompanied by reductions in average fare. They also showed that networks serving large cities had lower fares than those serving smaller cities. The analysis suggested that the impact of greater hub concentration at the interline airport on 4-segment (connecting) markets, was to pass on the efficiency gains achieved to the consumer in lower fares. The authors noted that this may offset the possible increased fares experienced by hub-originating or hub-terminating passengers.
15.3 **LCC/New Carrier Entry**

15.3.1 In part due to findings from the literature on hub dominance, a considerable body of research has developed examining the impact of new entrant airlines, particularly LCCs. While some have simply examined the change in fare and service brought about by the new entrants, others have explored the factors affecting entry decisions and the response of incumbent carriers.

15.3.2 *Bennet and Craun (1993)*

The U.S. DOT published a report charting the rise of U.S. LCC, Southwest (Bennett and Craun, 1993). The authors characterize Southwest as focussed (at that time) on short-haul, high-density markets, offering point-to-point service with unit costs one half to two thirds of its network carrier competitors. The paper examines Southwest's impact on the California corridor (San Francisco - Los Angeles). Operating out of Oakland, the carrier started service to Los Angeles International, Los Angeles Ontario and Burbank.

15.3.3 From start of service in Q1 1989 to Q3 1992, Southwest's traffic grew dramatically to the point where it became the largest carrier in the corridor (with a 42% traffic share), despite not serving San Francisco International. Average fares on the Oakland-Ontario route declined by 60% and traffic trebled. In addition, average fares on competing routes which Southwest did not serve, such as San Francisco-Los Angeles, also declined, resulting in increased traffic on those routes. (The authors conclude that Southwest's phenomenal traffic growth came largely from growing the market, rather than at the expense of competing routes).

15.3.4 The research also observed that many airlines, particularly smaller airlines, eventually exited the market, unable to compete along with Southwest. Remarkably, the authors (DoT) raised concerns that Southwest's success may result in it being a monopoly carrier in many markets, and that government policy needs to encourage new LCC entry to discipline Southwest (that said, there is no evidence of Southwest abusing its dominant position in any markets).

15.3.5 *Gillen and W. Morrison (2003)*

This paper developed theoretical models to examine the interaction between network carriers and LCCs. The authors apply the point of view that airlines provide a bundle of services, of which flying is just one component. The network carrier’s bundle includes in-flight service, lounges, minimal connection times through high frequency services and, to some extent, reduced access times through use of convenient airports. The LCC unbundles many of these features, focussing on just those which are profitable. So, they do not (always) provide in-flight services, provide poorer connectivity and generally use secondary airports with longer access times. LCCs attract passengers who are willing to forgo various parts of the network carrier bundle in order to enjoy lower fares.
15.3.6 The authors point out that LCCs set capacity and then price to profit-maximize while it appears that network carriers do the opposite, by adjusting capacity after having set prices (by shifting seats between fare buckets). This would appear to indicate that network carriers are market share focussed while LCCs are profit maximizing.

Factors Affecting Entry by a New Carrier

15.3.7 S. Morrison and Winston (1990)
This paper examined the factors that affect route entry and exit decisions of airlines (both network and LCCs). Using DB1A data from 1979 to 1988 on 13 U.S. airlines, the authors estimated probit models of route entry and route exit. The route entry model related the probability of entry to the airline’s traffic share at the origin and destination airports (percentage of departures), the same market share of the largest competitor airline, average route yield relative to other routes of similar distance, population at the origin and destination, and a dummy indicating a slot constrained airport at either endpoint. The route exit model related probability of exit to the same variables.

15.3.8 The route entry model found that a carrier’s size (as measured by the traffic share at the origin and destination airports) had the largest influence on route entry. However, a competitor's size had no significant impact on entry decisions. The analysis also showed that higher route yields deterred entry, against the authors’ initial expectations. They suggest that high fares may signal significant barriers to entry (such as frequent flyer programs) which deter entry. However, this deterrence effect was relatively small compared with the effect of the carrier’s own network – a 2.4% increase in network size offset a 10% fare premium. The results for the route exit model found similar results, but of opposite sign.

15.3.9 Ito and Lee (2003)
Over a decade later, Ito and Lee (2003) examined the factors affecting route entry decisions by LCCs. The authors note that LCCs had expanded dramatically during the 1990s. In 1990, LCCs accounted for 7% of domestic O/D passengers in the U.S.; by 2002 they accounted for 25% of domestic O/D passengers. In order to understand LCC entry decisions and to forecast the future growth of the LCC market, the authors estimated a probit model of LCC entry. The estimation related the probability of LCC entry onto a route to route traffic density, distance, route and airport concentration (Herfindahl-Hirschman Index), price before entry, endpoint population and income and dummies indicating a hub or congestion at either endpoint.

15.3.10 The estimation results indicated that traffic density and pre-entry price were the most important factors in deciding entry. Income and population had a negative impact on the

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1 Probit analysis is a statistical regression method which determines the factors which affect the probability of something happening.
probability of entry, suggesting that LCCs tend to avoid large metropolitan areas and large business centres in favor of secondary airports. The presence of a network hub at either route endpoint reduced the probability of LCC entry, as did airport congestion. The Herfindahl-Hirschman Index variables were not significant, suggesting that pre-existing competitive factors do not play an important role in LCC entry decisions.

15.3.11 The model was used to estimate the extent of LCC entry in the future, by applying the model to a large selection of routes currently without LCC service. The model estimated that in the long-term an additional 24% of network carrier’s domestic revenues could be exposed to LCC competition, increasing their total revenue exposure from 31.7% (in 2002) to 55.7% of domestic revenues.

Impact of LCC Entry

15.3.12 Windle and Dresner (1995) This paper examined the impact of LCC entry on fares and traffic levels, and whether the impact was different from entry by a network carrier. They also examined whether the fare and traffic effects were sustained beyond the initial “promotional” period.

15.3.13 Using time series plots of DB1A data from 1991 to 1994, they found that, on average, route fares declined by 12% immediately following entry by a network carrier then increased to reach a fare level just 5% below the pre-entry level one year later. Traffic was 17% above pre-entry levels one year after entry. By contrast, entry by Southwest reduced the average route fare by 48% and remained close to that level over the following year. Traffic levels on routes entered by Southwest increased by 200%, on average, one year after entry. The impact of other non-network carriers was less dramatic than Southwest but larger than the network carriers – fares declined by 20% one year after entry and traffic increased by 50%. Windle and Dresner also observed that average fares did not increase if the entrant later exited the market and that traffic levels remained at pre-exit levels.

15.3.14 The authors formalized their findings using a regression model which related average route fare to distance, total passengers, concentration (Herfindahl-Hirschman index of route concentration), other market factors and airline specific dummy variables. The regression analysis found that the presence of LCCs such as Southwest on a route had a much larger impact on fares than any network carrier. The impact of carrier identity was so large as to make the coefficient on route concentration insignificant. I.e., the identity of the carriers on the route is more important than the number of carriers on a route or their market share.

15.3.15 Dresner, Lin and Windle (1996) These researchers further examined the impact on fares resulting from the entry of an LCC. The research examined not only the impact on fares on the route entered but also
the impact on fares on other routes from the same airport and on similar routes from nearby airports. The aim of the analysis was to determine whether entry by an LCC on a route from a given airport reduces fares on other routes from that airport, and if it also reduces fares at nearby airports on competing routes. The authors examined Southwest’s entry into Baltimore/Washington airport (BWI) flying to Cleveland and Chicago Midway.

15.3.16 They found that average fares on the Southwest routes from BWI declined by 60-75%, and that fares on other routes from BWI not operated by Southwest declined by 18-40% (the effect was more pronounced on routes of a similar length to those operated by Southwest). They also observed fare reductions at nearby Washington Dulles and National airports on routes to Ohio and Chicago though the reductions were fairly modest.

15.3.17 More sophisticated regression analysis was then carried out to produce more generalized results and control for other factors that may affect fares. Simultaneous yield and passenger equations were estimated using DB1A data from Q1 1990 to Q3 1994 covering the top 200 U.S. domestic routes. Average yield on a route was related to passenger volume on the route, distance, market concentration (Herfindahl-Hirschman index) and dummy variables indicating whether there was an LCC on the route or other routes from the origin airport.173 Route passenger volumes were a function of distance, yield, population and per capita income at the endpoint cities and other market variables. While this analysis specification could pick up the impact of LCC entry on other routes from the airport, it was not intended to capture the impact on other nearby airports.

15.3.18 The regression analysis found that entry by an LCC on a route reduced average route yields by 38% (if the LCC was Southwest, yields reduced by 53% - a larger impact than the average LCC). **Entry of an LCC at an airport reduced yields by 0-41% on routes not served by the LCC (the more routes the LCC operated on, the larger the reduction in yields on other routes).** If the LCC was Southwest, average yields on routes not operated by Southwest declined by 8-45%. **The authors concluded that the influence of LCCs extended beyond just the routes they served and could even impact on other airports.**

15.3.19 S. Morrison (2001)
Writing on his own, the author examined the impact of LCC entry (or more specifically, entry by Southwest) on other routes from the same airport (referred to as potential competition) and on competing routes from other nearby airports (referred to as adjacent competition). Using DB1A data for 1998, Morrison estimated a regression model relating the average route fare to distance, number of carriers on the route, other market factors and dummies indicating whether Southwest operated on the route, or on a competing route, or from the same airport.

173 Other market and operational variables were also included.
The analysis found that Southwest's presence on a route reduced fares by 46% on average (compared to routes without Southwest) and that Southwest's presence on a competing route (adjacent competition) reduced average fares by 15-26% (depending on route characteristics). Southwest's presence at either endpoint airport reduced the average route fare by 6-13%, while Southwest's presence at both endpoints reduced average fares by 33%. The analysis also included a dummy indicating where either endpoint airport was dominated (that is, one airline accounted for 60% or more of enplanements), and found that airport dominance increased fares by only 5.7%.

Morrison took the analysis one stage further to estimate the total annual savings to travellers of Southwest's presence. Southwest was estimated to provide $12.9 billion in savings to travellers per annum, $9.6 billion of which was due to actual or adjacent competition and $3.3 billion was due to potential competition. The author states that the results are both troubling and encouraging. Troubling, as one airline accounts for so much of the fare reductions following deregulation. Encouraging, as it provides a direction on policy that will encourage further entry and competition. Morrison argues that the best way to achieve this is to allow entry by foreign-owned carriers.

This paper also examines the impact of Southwest's entry into an airport on fares on competing routes at other nearby airports (with no Southwest service). For example, the average fare on the Chicago O'Hare-Columbus before and after the startup of Southwest's Chicago Midway-Columbus service. Vowles compared fares in different multi-airport regions before and after entry by Southwest into one of the airports.

The analysis found that, in general, airports nearby to an airport which Southwest enters also experiences a fares decline even though they have no service. Of 47 routes examined, 36 experienced a fares reductions following Southwest service at a nearby airport. Vowles also found that, generally, the services at airports that lowered fares did not experience an increase in traffic. The lowered fares were in order to maintain (or avoid a significant reduction in) traffic levels in the face of competition from Southwest at a nearby airport.

Incumbent Response to LCC Entry

This paper examined how incumbent carriers responded to entry by an LCC. Their paper was in response to research by the U.S. DOT in 1996 which examined the impact of LCC entry on Delta Airlines' fares at its hubs in Atlanta and Salt Lake City. The DOT found that at that time Delta reduced fares on routes with LCC competition while increasing fares on routes without LCC competition (presumably to compensate for losses/reduced profits on the LCC routes).
Windle and Dresner carried out further research into the DOT's findings. They focused on Delta's response to entry by LCC ValuJet at its hub in Atlanta. The analysis took the form of regression models relating Delta's route yield to distance, population at the route endpoints and other market factors. Separate models were estimated for routes with competition from ValuJet and routes without, and for direct and connecting markets.

The results of the analysis showed that Delta's yields declined by about 25% on routes where they competed with ValuJet, relative to an index of the national average yield. On routes where Delta did not compete with ValuJet, yields were roughly in line with the national average, and in some cases were 10-15% below the national average. The authors found no evidence of Delta increasing yields on non-ValuJet routes to compensate for yield reduction on routes with competition from ValuJet. This supports the argument that airlines practice rational economic pricing on their networks (i.e., the carriers do not increase fares on non-ValuJet routes as they are already profit maximizing). They suggest that the DOT analysis did not correct for exogenous and endogenous factors which may have affected the results.

Lin, Dresner and Windle (2001)
In a later paper, Lin, Dresner and Windle (2001) examined, in a more generalized way, incumbent response to entry by a new carrier. The analysis covered entry by network carriers as well as LCCs, focusing on the factors affecting the incumbent's fare response. The difference in the incumbent's fare before and after entry of another carrier was regressed against variables representing the incumbent's health and size, the entrant's health and size, the entrant's entry strategy and various market factors.

On average, the incumbent's fare declined by 9-10% following successful entry by another carrier. The regression analysis indicated that the lower the entrant's fare, the lower the incumbent fare in response (i.e., the incumbent matches the fare behavior of the entrant). Also the more passengers the entrant attracts, the more the incumbent will discount its fares. The incumbent reduces fares less aggressively the lower the unit cost of the entrant indicating that the incumbent believes price cuts will be less effective against an efficient carrier with a cost advantage. The incumbent discounts less aggressively if the entrant is Southwest or another non-major carrier than if the entrant is a major network carrier. Smaller incumbents tended to discount more aggressively, though the most aggressive discounter was Southwest, indicating that it protects its position as the price leader. The analysis also found evidence that incumbent fares remain low even if the entrant later abandons the routes, possibly to deter future entry.

Ito and Lee (2003)

174 ‘Major carrier’ is termed defined by the U.S. Dept. of Transportation as those carriers with annual revenues in excess of one billion U.S. dollars.
This paper examined the incumbent’s reaction to LCC entry into routes to and from its hub. Using DB1A data from 1991 to 2002, they observed that, on average, the LCC entered a route with a fare 50% less than the incumbent’s pre-entry fare and provided about one third the capacity of the incumbent. In general, the response of the incumbent was modest – capacity was increased by 3-4% on average and fares reduced by 15%. The responses varied by airline – Delta was most aggressive in reducing fares (by 25% on average) and American the least aggressive (by 8% on average).

15.3.30 The authors then estimated a probit model examining the incumbent responses most likely to result in the LCC exiting the market. The probit analysis related the probability of LCC exit from a route to the incumbent’s change in capacity and fare following entry (relative to pre-entry levels), as well as the LCC’s initial capacity and fare, LCC size (in terms of total passengers), route traffic density, distance and other market factors. The analysis found that the incumbent’s capacity response had no impact on the probability of the LCC exiting, while the incumbent’s fare response had a negative impact (i.e., the larger the fare reduction the smaller the probability the LCC would exit). The authors suggest that this somewhat surprising result indicates that LCCs are more successful in markets that had pre-existing higher margins. The authors found no strong evidence that an incumbent’s capacity expansion or pricing decisions following LCC entry increased the probability that the LCC would exit the market. Rather, factors such as the entrant’s capacity choice, pre-existing market density and the LCC’s pre-entry presence at the market endpoints of a route appeared to contribute to the LCC’s ultimate success or failure.

Conclusions

15.3.31 The literature on hub dominance revealed that the presence of an LCC on a route had a dramatic impact on average fares. This resulted in a new series of studies which examined the LCC issue in more detail. Key conclusions emerging from the literature are that a) the presence of an LCC has a very large impact on average fares in an airline market, and b) fares on adjacent routes (i.e., routes not served by the LCC, but where the LCC has service at one end of the route, or at a nearby airport) are also reduced.

15.3.32 The following table summarises the key studies in this line of research.

Summary Table – LCC Related Research Papers

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
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<tbody>
<tr>
<td>LCCs Generally</td>
<td></td>
<td></td>
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<tr>
<td>Bennett and Craun</td>
<td>Examined fares and traffic in the California corridor before and after entry by Southwest.</td>
<td>Southwest became the dominant carrier within 3 years of entry. Average fares on Oakland-Ontario declined by 60% and traffic trebled.</td>
</tr>
<tr>
<td>(1993)</td>
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<tr>
<td>Gillen and Morrison</td>
<td>Developed theoretical models to examine the interaction between</td>
<td>The authors point out that LCCs set capacity and then price to profit-maximise while its appears</td>
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<tr>
<td>(2003)</td>
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### Study Method Key Findings

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
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<tr>
<td></td>
<td>network carriers and LCCs.</td>
<td>that network carriers do the opposite, by adjusting capacity after having set prices (by shifting seats between price buckets). This would appear to indicate that network carriers are market share focussed while LCCs are profit maximising.</td>
</tr>
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</table>

### Factors affecting entry by a new carrier

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morrison and Clifford (1990)</td>
<td>Estimated probit models examining the factors affecting route entry and exit decisions of carriers (both LCC and network).</td>
<td>Found that the carrier’s own network size (as measured by its market share at the origin and destination airports) had the largest influence on entry and exit decision. The size of the competitor’s network had no significant impact.</td>
</tr>
<tr>
<td>Ito and Lee (2003)</td>
<td>Estimated a probit model examining the factors affecting route entry by an LCC. Used the model to forecast the growth in LCC service.</td>
<td>Found that traffic density and pre-entry price were the most important factors. Also found that pre-existing competitive factors did not play an important role in entry decisions. Estimated that over half of network carrier domestic revenues could eventually be exposed to LCC competition (up from 31% in 2002).</td>
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</table>

### Impact of LCC Entry

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
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<tr>
<td>Windle and Dresner (1995)</td>
<td>Examined impact of LCC entry on fares and traffic compared with the impact of network carrier entry. Also examined whether the fare reductions were sustained in the long run.</td>
<td>Entry by Southwest reduces fares by 48% and increased traffic by 200%. Entry by a network carrier reduced fares by only 5% in the long run and increased traffic by 17%. Also found fare and traffic levels did not change significantly if the entrant later exited the market.</td>
</tr>
<tr>
<td>Dresner, Lin and Windle (1996)</td>
<td>Using data plots and regression analysis, authors examined the impact of LCC entry into a route on fares on the routes as well as fares on competing routes from nearby airports and on other routes from endpoint airports.</td>
<td>Found that LCC entry reduced route yields by 38% (53% if the entrant was Southwest) and reduced yields on other routes at the endpoint airports by 0-41% (8-45% if the entrant was Southwest). Also found evidence that fares declined on competing routes from other nearby airports.</td>
</tr>
<tr>
<td>Morrison (2001)</td>
<td>Using regression analysis, examined Southwest’s impact on route fares, as well as fares on other routes from the airport and competing routes from nearby airports.</td>
<td>Entry by Southwest reduced route fares by 46%, reduced fares on competing routes by 15-26% and fares at the endpoint airport by 6-13%. Also found that one carrier dominating an airport increased fares by 5.7%.</td>
</tr>
<tr>
<td>Vowles (2001)</td>
<td>Examined the impact of Southwest’s entry into an airport on fares on competing routes at nearby airports. Compared fares before and after entry by Southwest.</td>
<td>Found that in general, nearby airports experienced fare reductions on competing routes. However, they did not experience any traffic growth as a result.</td>
</tr>
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</table>

### Incumbent Response to LCC Entry
<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windle and Dresner (1999)</td>
<td>Examined Delta’s fare response to entry by LCC ValuJet at its hub in Atlanta. Estimated regression models of route yield with separate models for route with ValuJet competition and without.</td>
<td>Found that Delta’s yield on routes with competition from ValuJet declined 25%. Yields on routes without ValuJet competition remained stable, and in some cases, declined by 10-15%.</td>
</tr>
<tr>
<td>Lin, Dresner and Windle (2001)</td>
<td>Examined the change in fares of the incumbent carrier following entry by another carrier (either LCC or network). Regressed the difference in before and after fares against various factors relating to the incumbent’s and entrant’s size and health, the entrants entry strategy, and other market factors.</td>
<td>Analysis found that the incumbent reduced fares more aggressively the lower the entrant’s fare or the higher the entrant’s market capture. The incumbent discounted fares less aggressively if the entrants was Southwest or another non-major carrier. Analysis also found that fares remained low even if the entrant later abandoned the route.</td>
</tr>
<tr>
<td>Ito and Lee (2003)</td>
<td>Estimated a probit model exploring the incumbent responses most likely to result in the LCC entrant abandoning a route. The probability of LCC exit was related to the incumbent’s fare and capacity response as well as the LCC’s characteristics and other market factors.</td>
<td>Found that the incumbent’s fare and capacity response had no significant impact on the probability of LCC exit. Rather, factors such as the entrant’s capacity, market density and the LCC’s presence at the endpoint airports appeared to contribute to the LCCs ultimate success or failure.</td>
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### 15.4 Alliances

15.4.1 Deregulation of aviation markets in the U.S. in 1978, and elsewhere over the next 15 years, led to a number of mergers between airlines within the domestic market, and to the development of a variety of domestic and international airline alliances. A small body of research has developed examining aspects of these mergers and alliances. Some focus on the motivations for the mergers or alliances while others examine the impact on pricing, consumer welfare, airline profits and competition.

15.4.2 Here, I examine the literature on the impacts of alliances, as the transaction between Qantas and Air New Zealand takes the form of an alliance (with an equity investment). It is not a merger, as it does not allow consolidation of corporate overheads, merging of brand identities, unification of work forces and fleets, etc.

15.4.3 *Hannegan and Mulvey (1995)*
This paper examined the impact of a number of international alliances on airlines and, to a lesser extent, consumers. The paper was summary of research carried out by the authors for the U.S. General Accounting Office. The research focussed on three major international alliances as well as some smaller regional alliances:

- Northwest/KLM (1992);
• British Airways/US Air (1993);
• United Airlines/Lufthansa (1994);

15.4.4 In general, the research found that the alliances improved connectivity of passengers, with greater choices of connecting services. Traffic increased on feeder routes. It also appeared to boost the revenues of the carriers in the alliance. The authors did not investigate the impact of alliance on airline costs, nor the impact on prices paid by consumers.175 The Northwest/KLM alliance was estimated to increase the two airlines’ combined transatlantic market share from 7% in 1991 to 11.5% in 1994. The alliance was estimated to have increase Northwest’s revenues by $125-175 million, a 33% increase in its transatlantic revenues. The alliance also increased traffic on feeder routes. E.g., traffic increased on US Air’s domestic services connecting with British Airways’ transatlantic service. Again, this was largely at the expense of other carriers.

15.4.5 The authors conclude that in general, codesharing alliances have been an effective marketing strategy for the airlines, expanding their network scope and overcoming bilateral agreement restrictions.

15.4.6 In regard to consumer benefits, the authors note that the alliances result in consumers having a far greater selection of one-stop routings to destinations, with improved connection times and fairly seamless interchange. However, the authors did not examine the impact of the alliance on fares due to lack of available data (the U.S. DB1A data does not contain information on foreign airlines and does not identify code share tickets).

15.4.7 Oum, Park and Zhang (1996)
This paper uses a quantitative analytical approach to examining the impact on fares and traffic levels of international codesharing alliances. Specifically, the authors examine the effect on the fare and traffic volume of the market leader of an alliance between non-market leaders.176 The analysis used data on 57 international routes from 1982 to 1992 (North America-Asia and Asia-Australia routes) to estimate simultaneous demand and supply equations for the market leader.177 Route demand (market leader’s route traffic)
was specified as a function of fare, frequency, distance, feed traffic and a dummy indicating whether other carriers on the route were codesharing. Supply (set as the market leader’s price) was specified as a function of input costs, passenger volumes, distance, market share, other market factors and a dummy indicating whether other carriers on the route were codesharing.¹⁷⁸

15.4.8 The coefficient on the codesharing dummy of the demand function indicated that the market leader’s demand function shifted to the right, meaning that it experienced increased consumer demand for its services. The authors speculate that this surprising result is because either the codeshare service is replacing a single carrier service (i.e., the codeshare is an inferior product) or the codeshare service is priced higher than previous flights as it provides better interline service. The coefficient on the codesharing dummy of the supply function indicates that the supply function pivots downward – i.e., the market leader’s pricing conduct becomes more competitive. The authors estimate that, on average, codesharing by two non-market leaders reduces the market leader’s fare by 8% and increases its traffic by 11%.

15.4.9 Australia Productivity Commission (1997)
This is a Commission Information Paper on the economic impact of international airline alliances. The study undertook regression analysis of the impact of codesharing on international routes to/from Australia using a panel data set from 1992-1996. Analysis was conducted on specific fares (economy and discount – lowest return economy) rather than on average fares.

15.4.10 Key findings are that code sharing alliances lead to a reduction in standard economy fares and no impact on discount fares. As the Commission stated:

> Overall, the quantitative analysis presented here suggests that the presence of code sharing on international routes to and from Australia is estimated to have led to a reduction in standard economy fares. There also appears to be a significant negative relationship between the proportion of code shared seats and the level of standard economy fares on that route. However, these two code sharing variables have an insignificant effect on discount fares. This result may point to the presence of tight profit margins in the discount fare market reflecting the already strong competition in this market segment. Indeed it is expected that airlines would reduce the price of economy fares rather than discount fares on the basis that it may encourage some substitution from discount to economy fares and serve to improve the profit margin on a route.

15.4.11 Park and Zhang (2000)

¹⁷⁸ The demand and supply equations were estimated using non-linear three-stage least squares (a log-linear functional form was used).
This paper carried out further analysis of international alliances, examining the price, traffic and consumer surplus impact of four transatlantic alliances:

- British Airways/US Air (1993);
- Delta/Sabena/Swissair (1992);
- Northwest/KLM (1992);
- United Airlines/Lufthansa (1994).

15.4.12 Supply and demand functions were simultaneously estimated for the transatlantic market using data on routes between 19 North American and 12 European “gateway” cities from 1990 to 1994. Demand (annual traffic on a route) was specified as a function of price, endpoint population and income, route-specific dummies and post-alliance dummies for each of the four alliances. Supply (average route fare) was specified as a function of traffic volume, input costs, airline and route specific dummies and post-alliance dummies for each of the four alliances. Again, their data on price is a single published fare, as average fare data is not available.

15.4.13 The demand equation indicated that, in 3 out of the 4 alliances, traffic increased following the alliance on the affected routes: British Airways/US Air by 13%, KLM/Northwest by 35%, Lufthansa/United by 13%. The Delta/Sabena/Swissair alliance reduced traffic by 25%, which the authors attributed to reductions in overall frequency and poor feed traffic co-ordination. The supply (price) equation indicated that 2 of the 4 alliances conclusively resulted in fares reductions: KLM/Northwest by 22%, Delta/Sabena/Swissair by 13%. The British Airways/US Air alliance resulted in a 12% reduction in fares but the coefficient was statistically weak. The Lufthansa/United alliance increased fares by 9.2% but again the coefficient was statistically weak.

15.4.14 Using the estimated models the authors were able to estimate the change in consumer surplus resulting from the alliances, by comparing ‘with alliance’ and ‘without alliance’ results from the model (by switching on and off the post-alliance dummies). The model found that 3 of the 4 alliances increased consumer surplus. Only the Delta/Sabena/Swissair alliance was estimated to have reduced consumer surplus.

15.4.15 Oum (2001) Commissioned by the Canada Transportation Act Review Panel, Oum examined the impact of global alliances on the air passenger market. The majority of the paper was based on previous research by the author.

15.4.16 The paper summarises research by Oum, Park and Zhang in 2000, which examined the impact of alliances on airline productivity, pricing and profitability. Using panel data of 22 international airlines from 1986-95, they estimated three regression models relating
productivity (Total Factor Productivity for each airline), price (revenue/passengers) and profitability (total revenue/total cost) measures to control variables such as average stage length, airline size (# employees), a time trend variable, and the number of major and minor alliances the airline was participating in. Major alliances were global network based strategic alliances (e.g., Star Alliance or oneWorld) so the variable took the value zero or one. Minor alliances were route-based tactical alliances.

15.4.17 The analysis found that participation in a major alliance increased an airline’s Total Factor Productivity by 4.9%, and each minor alliance increased productivity by 0.9% though the coefficient was not statistically significant at the 10% level. A major alliance reduced average airline prices by 5.5%, while minor alliances reduced prices by 0.3% but was not statistically significant. A major alliance also increased profits by 1.4% while a minor alliance had no statistically significant effect.

15.4.18 Oum’s paper goes on to describe a theoretical model developed by Oum, Park and Zhang in 2000, which examined the effect of alliances on equilibrium market outcome. The model examines a three carrier market, where two carriers then form an alliance.

15.4.19 This analysis found that a complementary alliance (two carriers connecting their network) would result in greater overall output in all markets but with the output of the non-alliance carrier decreasing. The alliance partners also earn greater profits (and the non-alliance carrier less profits), and price would decrease on at least one of the complementary alliance routes. Overall, consumer surplus and economic welfare would likely increase. A parallel alliance (alliance carriers operating on the same route), would reduce total output on alliance routes (impact on non-alliance carrier output unknown). Price would likely increase and consumer surplus decrease.

15.4.20 Oum goes on to describe the impact of alliances on routing quoting previous research by Oum, Taylor and Zhang in 1993. Looking at the BA/USAir, KLM/NW, Lufthansa/United and Delta/Swiss/Sabena alliances as well as Air Canada/Lufthansa, they found that the alliance airlines generally routed an increasing volume of inter-continental traffic through their main hubs. This resulted in lost traffic for secondary gateway airports.

15.4.21 Morris and Hamilton (2002)
This paper carried out a review of research into airline alliances which covered 12 studies between 1992 and 2000, some conceptual, some empirical. The review uncovered some fairly consistent findings:

- **Rationale.** A number of rationales have been put forward for the development of alliances - cost savings, market penetration, access to new markets, feed traffic, defence of current market share, overcoming capacity constraints (e.g., use partner’s under-utilised slots), overcoming government regulation. The review uncovered some further consistent findings:
• **Success Rate.** Alliances have had a fairly high failure rate – in 1995, the Boston Consulting Group estimated that fewer than 40% of regional and 30% of international alliances had been successful (i.e., had not been dissolved). The success of alliances depends on well managed integration of operations and strategies and a willingness to learn from partner airlines.

• **Frequency and Traffic.** In general, alliances increased frequency and improved connectivity and this often resulted in increased traffic volumes. However, much of the traffic growth is diversion from other, non-alliance carriers (i.e., alliance resulted in redistribution of traffic rather than generation). One study by Oum, Park and Zhang (2000) also found that alliance increased productivity by 1.7-4.8%.

• **Fares.** There have been mixed findings in regards to the impact on fares. One study found that the equity alliance between Swissair and SAS resulted in higher fares. A number of other studies have found fares decreased in most cases.

• **Profitability.** Studies in this area found that alliances generally increased profits for the alliance partners, largely at the expense of airlines outside the alliance. Minor alliances generally had no impact on profitability.

15.4.22 Morris and Hamilton conclude that there was no conclusive evidence that major airlines have been able to use global alliance to restrict competition and boost profitability. Improvements in terms of load factors and productivity have, for the most part, been accompanied by fare reductions of similar level, resulting in only modest gains for carriers. Alliances appear to be a means to preserve already thin margins, rather than an attempt to generate large producer surpluses.

15.4.23 Armentier and Richard (2003)
This paper examines the consumer welfare impact of a 1999 codeshare agreement between Continental (CO) and Northwest (NW). Using U.S. DOT DB1A database, a logit regression is estimated.

15.4.24 They note that their previous research found that the CO-NW alliance reduced the fares of point-to-point travellers 82% of the time (median reduction: 3.4%) and increased the fares of connecting passengers 85% of the time (median increase: 6.4%). The regression included a dummy variable indicating whether a flight is a CO-NW codeshare. The model found that the codeshare increased consumer welfare by over 5% for point-to-point codeshare passengers from increased number of services to choose from and by over 1% due to lower prices. The authors claim this alliance reduced the number of available non-stop flights, reducing consumer surplus by 2.75%, and thus also increased travel times. Critical to the author’s claim of an overall decline in consumer surplus was a finding that simply because the airlines were CO and NW, consumer surplus was reduced by over 5%, although they gave no coherent rationalisation for this claim. Thus this codesharing
15.4.25 The regression analysis for this paper contained many technical “fixes” to allow for the facts that consumers have heterogeneous preferences for flight attributes, that the price can vary substantially for the same flight and that the price quoted to the consumer for alternative travel is not observable. The complexity of the “fixes” and the unexplained inclusion of a dislike of these two carriers make the author’s conclusions dubious.

15.4.26 Brueckner (2003) This paper examined the impact of code sharing and antitrust immunity on interline fares paid by international passengers. Using DB1A data, the author examined interline tickets involving a U.S. and foreign airline. A regression model was estimated which related the interline fare to measures of airline co-operation and other explanatory variables. The variables included distance, market size, number of carriers on the route, country and airline specific dummies, and dummies indicating whether the interline airlines were codesharing partners, had antitrust immunity and/or were members of a formal alliance (e.g., oneWorld).

15.4.27 The analysis found that codesharing reduced interline fares by 8-17%, depending on the estimation method and sample used (a number of alternative specifications were tried). The presence of antitrust immunity reduced interline fares by 13-21%. The analysis also showed that the codesharing and antitrust immunity were substitutes to some extent, as the combined effect was smaller than the sum of the parts. Where the interline airlines were codesharing and had antitrust immunity, interline fares were reduced by 17-30%. The effect of a formal alliance had no statistically significant impact on interline fares, indicating that no separate fares effect of alliance membership could be identified. Codesharing and/or anti-trust immunity are necessary to have a fare effect. The author concludes that the results provide strong evidence that airline co-operation generates substantial benefits for interline passengers.

Conclusion

15.4.28 There is still only a limited literature on the effect of alliances on air fares, and much of this is based on data limited to a published fare, rather than average fares, thus conclusions must be viewed as preliminary. The evidence available, however, does not support a conclusion that alliances create market power. Most of the evidence points to fare reductions, especially for passengers using connecting services. The literature suggests, but does not quantify the additional benefits to these consumers of improved connectivity.

179 Although DB1A generally does not contain data on foreign airlines, tickets sold by these airlines which involve one or more segments on a U.S. carrier are included.
15.4.29 The following table provides a summary of the papers reviewed.

**Summary Table – Alliances**

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
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</thead>
<tbody>
<tr>
<td>Hannegan and Mulvey (1995)</td>
<td>Examined 3 major transatlantic alliances, and their impact on traffic and revenues.</td>
<td>Found that, in general, alliances increased the combined traffic of the carriers involved, largely at the expense of other carriers. Likewise, most alliances resulted in an increase in revenues for the carriers involved.</td>
</tr>
<tr>
<td>Oum, Park and Zhang (1996)</td>
<td>Estimated simultaneous demand and supply functions to examine the impact of an alliance by two non-market leaders on the fare and traffic of the market leader.</td>
<td>Estimated that codesharing by two non-market leaders reduced the market leader’s fare by 8% and increased its traffic by 11%.</td>
</tr>
<tr>
<td>Australia Productivity Commission (1997)</td>
<td>Regression analysis of the impact of codesharing on international routes to/from Australia.</td>
<td>Codesharing led to a reduction in standard economy fares and had no impact on discount fares.</td>
</tr>
<tr>
<td>Park and Zhang (2000)</td>
<td>Estimated simultaneous demand and supply functions to examine the impact on fares, traffic and consumer surplus of four major transatlantic alliances.</td>
<td>Found that 3 out of 4 alliances resulted in increased traffic on the routes affected by the alliance. In addition 2 out of 4 alliances conclusively resulted in lower fares, and 3 of the 4 alliances resulted in increased consumer surplus.</td>
</tr>
<tr>
<td>Oum (2001)</td>
<td>Regression analysis of the impact of alliance participation on airline productivity, price and profits.</td>
<td>Found that participation in a major alliance increased productivity by 4.9%, reduced price by 5.5% and increased profits by 1.4%.</td>
</tr>
<tr>
<td>Morris and Hamilton (2002)</td>
<td>Reviewed 12 research studies examining the impact of airline alliances.</td>
<td>Found no conclusive evidence that major airlines have been able to use global alliances to restrict competition and boost profitability. Alliances appear to be a means to preserve already thin margins, rather than an attempt to generate large producer surpluses.</td>
</tr>
<tr>
<td>Armentier and Richard (2003)</td>
<td>Estimated a logit model of airline choice to calculate the consumer welfare impact of a codeshare agreement between Continental and Northwest.</td>
<td>The codeshare was estimated to reduce consumer welfare. The analysis approach is flawed, casting doubt on the conclusions.</td>
</tr>
<tr>
<td>Brueckner (2003)</td>
<td>Used data on international interline fares from the U.S. to estimate a model relating yield to measures of airline cooperation (codeshare, antitrust immunity and formal alliances) and other</td>
<td>Found that codesharing reduced interline fares by 8-17% and antitrust immunity reduced fares by 13-21%. The two were found to be substitutes to some extent as the combined impact reduced interline fares by 17-30%.</td>
</tr>
</tbody>
</table>
15.5 Fare Wars

15.5.1 Since deregulation, the U.S. airline industry has been subject to significant numbers of price wars. These wars have added to the already volatile nature of the airline business. A small amount of research has developed examining the impact and causes of airline price wars.

15.5.2 S. Morrison and Winston (1996)
This paper examined the cause and effect of fare wars using DB1A data from 1979 to 1995. The authors defined a fare war as when the average fare on a route declined by at least 20% from one quarter to the next. The fare war was considered ended when the route’s average fare rose by any amount. A permanent drop in fares as a result of entry by a new carrier was not considered a fare war – fare had to go up again. Using this definition it was found that the percentage of routes experiencing a fare war at any given time ranged from 1-13% over the period examined. On average, a fare war reduced route fares by 32.4% during the war. Nearly 90% of fare wars lasted two or fewer quarters but it took just over 8 quarters, on average, for route fares to return to their pre-war levels.

15.5.3 The authors then estimated a probit model where the probability of a fare war on a route was a function of external economic effects (GDP deviation from trend, Gulf War, airline costs), competitive conditions (number of airlines on route, changes in market share, amount of multi-market contact, airline specific dummies) and route characteristics (a previous fare war on the route, slot-constrained airports, endpoint population and income).

15.5.4 The analysis found that deviations of GDP from trend (upwards or downwards) increased the likelihood of a fare war and that the effect was stronger in a recession than in a boom. The likelihood of a fare war falls as airline costs increase. There was weak evidence from the airline-specific dummies that the presence of established network carriers (e.g., American, United, Delta) on a route tended to discourage fare wars. On the other hand, the presence of a non-major airline, or an LCC carrier, tended to encourage fare wars.

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180 As validation, this definition was compared against the number of news stories on airline fare wars – a correlation of 75% was found.
181 ‘Major airline’ is a regulatory distinction in the U.S., denoting an air carrier with operating revenue greater than US$1 billion per annum.
(e.g., Southwest especially, Alaska, America West, Braniff 2). An increase in the number of carriers on a route increased the probability of a fare war, as did increases in multi-market contact.

15.5.5 Fare wars were more likely on routes that had already experienced fare wars, and less likely on routes involving slot-constrained airports. The probability of a fare war increased with the population and income of the origin and destination cities. Using the probit model, the authors also estimated that fare wars had reduced airline profits by a cumulative total of $7.8 billion from 1979 to 1995. It was estimated that 25% of the losses were due to GDP variation, 28% due to route competition, 13% due to multi-market carrier contact (the rest was the result of other factors).

15.5.6 Ross (1997)
This paper also examined the causes of fare wars but used a different measure to determine the occurrence of a fare war. Ross argued that average route fare was not an effective measure of fare wars due to the high level of price differentiation practised in the airline industry (the average could hide changes in different fares classes). Instead a rank dominance criterion was used to define fare wars, which divided the distribution of fares into quintiles and considered each quintile separately. This method is capable of detecting a decrease in fares in the lower quintiles even when fares are increasing in the upper quintiles. Also, the fares in one quarter were compared against fares in the same quarter of the previous year rather than comparing quarter-to-quarter changes. This definition of fare war was used to estimate a probit model which related the probability of a fare war on a route to the change in passengers since the previous quarter, change in market share, a measure of multi-market contact, percentage of roundtrip tickets on the route (used as indicator of a lower elasticity market), distance, frequency, and load factor.

15.5.7 A second model was also estimated examining the behaviour of airlines once a fare war had started – do they stay on the route or exit? This second model related the probability of route exit to market concentration at the route endpoints (Herfindahl-Hirshman index), a dummy indicating a hub endpoint, average yield, distance, airline specific dummies and other cost related variables.

15.5.8 The first (fare war) model indicated that shifts in market share can bring about a fare war. (i.e., if a carrier’s market share is declining, they react by cutting fares). However, multi-market contact had no significant effect on the probability of fare wars, counter to the findings of Morrison and Winston (1996). However the author notes this may be a limitation of the data period used (the data was from 1990 to 1992, a recessionary period for the U.S. economy). The analysis indicated that fare wars were more likely on routes with high consumer elasticities. Fare wars were less likely on higher frequency routes or with higher load factors, suggesting fare wars are less likely on “successful” routes.

15.5.9 The second (market exit) model indicated that carriers are less likely to leave a
concentrated route but will readily abandon service to the hub of another carrier. Also, carriers are less likely to abandon long distance routes but more likely to abandon high frequency routes. **The presence of Southwest on a route greatly increased the probability of exit** – the probability of route exit quadruples compared with other carriers.

15.5.10 **Fournier and Zuehlke (2003)**

These authors also used a rank dominance approach to identify fare wars but argued that Ross had overestimated the number of fare wars. The authors used a more stringent definition and also carried out quarter-to-quarter comparisons rather than year-on-year. Using this measure they estimated a probit model relating the probability of a price war on a route to a Herfindahl-Hirschman index of route concentration, average route load factor, a measure of multi-market contact, dummies indicating entry by a network or LCC carrier and other market and airline-specific variables and dummies.

15.5.11 The estimation results suggested that the probability of a price war decreased the greater the multi-market contact, counter to the findings of Morrison and Winston (1996). The authors postulate this is due to mutual forbearance. Increased market concentration or hub dominance increased the probability of a fare war as did the entry of a new airline on to the route. However, there was no statistically significant difference between the entry of a network carrier and the entry of an LCC.

**Conclusions**

15.5.12 The literature on fare wars is thin, with no clear results present at this time.

15.5.13 The following table summarises the three studies reviewed.

**Summary Table – Fare Wars**

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morrison and Winston (1996)</td>
<td>Estimated a probit model relating the probability of a fare war on a route to economic conditions, competitive conditions and route characteristics. Used U.S. data from 1979 to 1995.</td>
<td>Estimated that economic conditions (i.e., recession or boom) accounted for 25% of fare war impacts, route competition accounted for 28% and multi-market contact accounted for 13% (greater multi-market contact increased the probability of a fare war).</td>
</tr>
<tr>
<td>Ross (1997)</td>
<td>Estimated a probit model relating the probability of a fare war on a route to change in passenger density, change in market share, multi-market contact,</td>
<td>Found that shifts in market share increased the probability of a fare war, as did higher consumer elasticities. Fare wars were less likely on high frequency or</td>
</tr>
</tbody>
</table>

14 April 2004
<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>consumer price elasticity and other factors. Used U.S. data from 1990 to 1992.</td>
<td>high load factor routes – fare wars are less likely on &quot;successful&quot; routes. Multi-market contact had no impact on fare wars.</td>
<td></td>
</tr>
<tr>
<td>Fournier and Zuehlke (2003)</td>
<td>Estimated a probit model relating the probability of a fare war on a route to route concentration, multimarket contact, new carrier entry and other factors. Used U.S. data from 1996 to 1999.</td>
<td>Found that greater multimarket contact reduced the probability of a fare war (possibly due to mutual forbearance). Increased market concentration or hub dominance increased the probability of a fare war as did entry of a new airline on to the route. However, no difference was found between entry by a network carrier and entry by an LCC.</td>
</tr>
</tbody>
</table>

15.6 Conclusions

15.6.1 This Appendix contains an extensive review of the economics literature of the effect of market structure on prices in airline markets. This literature was largely based on U.S. data, in part because it has the publicly available data on individual ticket purchases, from which average prices can be computed. Because of the large number of fare classes on any route, use of any single published fares can conceal what consumers are actually paying in markets. As well, the U.S. has had the longest experience with deregulated markets.

15.6.2 The U.S. based literature began with an investigation of whether hub dominance was resulting in exploitation of market power by the dominant hub carrier. From there, it branched to investigate other issues, primarily that of the impact of low cost carriers on fares paid. A separate literature has begun to investigate the impact of international airline alliances on fares, although this is constrained by the lack of data on average fares paid by consumers.

15.6.3 The hub dominance literature initially indicated that fares were higher for trips that originated from hub airports. A 1990 study by the U.S. General Accounting Office (GAO), for example, suggested that the hub premium was 27%. As well, the literature indicated that fares were lower in markets served by 2 or more FSAs.

15.6.4 However, these findings by the GAO did not control for key market characteristics which might explain why hubs would naturally have higher fares, and did not examine the impact of the presence of an LCC in the market.

15.6.5 To address this, researchers began to estimate statistical regression models, which allowed for ‘explanatory’ or ‘control’ variables, which would separate out the effects of
market characteristics versus hub dominance, if any.

15.6.6 While the GAO study found a substantial ‘hub premium’ in terms of higher fares per passenger kilometre (yields), it was found by later studies that most of the premium could be explained by the fact that trips from hubs tend to be of shorter distance than non-hub trips. Because there is a well known tapering of cost (and hence revenue) per seat kilometre with distance, the hub premium was disguising what was really a ‘short haul’ premium. Research by Morrison and Winston, for example, found that a 33% hub premium was reduced to only 5.2% when market characteristics were properly accounted for. The short haul effect, alone, accounted for almost 18% of the 33% fare premium.

15.6.7 Over a period from 1987 to 2003, a series of papers refined and expanded the investigation of the impact of market structure on fares. By 2003, the literature was indicating that

a) the fare premiums in concentrated markets (such as hub premiums) are due to a very large extent to market characteristics (such as trip distance and whether a route serves a high portion of business trips) and not merely to market structure; and

b) The hub premium, if any, is 5% or less, with many studies finding premiums in the range of only 2-3%.

15.6.8 As the investigation of hub premiums progressed, research revealed that a strong determinant of average fare in a market was whether or not Southwest Airlines (the original LCC) was present in the market or not. This led to a literature extension to separately look at the effect of Southwest on average fares, and eventually to a more generalised effect of the presence or not of low cost carriers. This literature found that:

c) regardless of market structure, the presence of an LCC has a significant and dramatic impact on fares in the market;

d) the LCC effect is also present on routes where an LCC is not present, although somewhat smaller, where an LCC serves one or both ends of the route; and

e) the LCC effect is much larger than any hub premium which might be present in a market. Impact of LCC entry, for example, was being observed as resulting in reductions of average fares paid of up to 48%, with several studies showing impacts above 30%. These impacts were being found whether or not a route had one or more endpoints from a hub with a dominant air carrier.

15.6.9 While the literature was not intended to address this question, it was suggesting that if a choice has to be made between a market structure with one FSA and an LCC, versus one with 2 FSAs, the former results in dramatically lower prices in the market. This is true even if one or both of the two FSAs dominate a hub.
15.6.10 A final observation is offered. There is a dichotomy in the literature between research conducted by or for government agencies and that conducted by the academic community. The former tends to focus on simple specifications that observe prices and then link price differences only to measures of market structure. The latter seek whether there are a variety of other explanations of market differences, and only after controlling for these is an attribution made to the effect of market structure.
Appendix L: Definition of variables used in regressions of Section 7

The following abbreviations are used for variable names in the regression analysis

**Dependent Variable:**

lnfareav  \( \ln(\text{average fare in the market}) \)

**Independent (explanatory) Variables:**

lnpass  \( \ln(\text{number of passengers on route}) \)

domhub  1 if one of the cities on the route is a GAS dominated hub, 0 otherwise

Indist  \( \ln(\text{route distance}) \)

sm, sl, ..., ll  FAA hub classification dummies. For instance, if sm is 1, that implies that one of the cities on the route is a small hub and one a medium hub. “l” stands for large hub, and “n” stands for non-hub.182

LCC  1 if a low cost carrier with at least 5% traffic share serves the route, 0 otherwise

The U.S. DOT classifications for LCCs were used. These are Southwest, JetBlue, Vanguard, Frontier, Air Tran, Spirit, Reno, Western Pacific and ATA. Note that the latter is different from Air Tran Airways.

LCC’n’  1 if exactly ‘n’ low cost carriers serve the route, 0 otherwise.

LCC2 is also equal to 1 if more than 2 low cost carriers serve the route.

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182 The data set has no cases of a route from a small hub to a non-hub.
FSA\textsuperscript{n} \quad 1 \text{ if there are exactly } \text{'}n\text{'} \text{ full service airlines serving the route,}  
\quad 0 \text{ otherwise.}  
\text{FSA4 is also equal to } 1 \text{ if more than } 4 \text{ full service airlines serve the route.}  

LCCFSA\textsuperscript{N} \quad \text{Defined as LCC } \times \text{ FSA\textsuperscript{N}} \quad  

LCC\textsuperscript{n}FSA\textsuperscript{m} \quad \text{Defined as LCC\textsuperscript{n} } \times \text{ FSA\textsuperscript{m}} \quad  

`\text{XX}'presence \quad 1 \text{ if carrier with OAG code } \text{XX} \text{ carries over } 5\% \text{ of the passengers} \quad  
\quad \text{on the route,}  
\quad 0 \text{ otherwise.}  

`\text{XX}'presFSA\textsuperscript{N} \quad \text{Defined as } `\text{XX}'\text{presence } \times \text{ FSA\textsuperscript{N}} \quad  

\text{ln} `\text{XX}'\text{seatstot} \quad \text{ln}(1+ \text{ total available seats offered by carrier } \text{XX} \text{ on the route})^{183}  
\quad \text{This is measured as direct and connecting seats offered for sale on the} \quad  
\quad \text{route. This data was obtained from Back Data Solutions.}  

\text{quart}'\text{N} \quad 1 \text{ if the observation is from the Nth quarter of the year} \quad  
\quad \text{Quarter 1 is January - March}  

\text{yeardum}'\text{N} \quad 1 \text{ if the observation is from the Nth year of the sample.} \quad  
\quad 1990=1.  

\text{Constant} \quad \text{a constant variable}  

\textbf{Instrumental Variables}  

\text{Lnincprod} \quad \text{product of the incomes of the two cities at each end of a route}  

\text{Lnpopprod} \quad \text{product of the populations of the two cities at each end of the routes}  

\text{Tempdiff} \quad \text{absolute value of the difference in mean temperatures of the two routes}  

\text{In addition to route distance, all of the dummy variables were also used as instruments (year and} \quad  
\text{quarter dummies, whether LCC or FSA, whether route has a dominant carrier at a hub). Traffic} \quad  
\text{level was not used as an instrument.}  

\quad \text{---}  

\textsuperscript{183} \text{One is added to deal with those observations which have no seats offered for sale.}  

\text{---}
Appendix M:
Regression Results for Section 5.3  (U.S. data)
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<th>Model 3</th>
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Appendix N: Canadian L-class fares on selected routes

The following data were obtained from the August ATPCo database for the lowest L class fares with a 7 day advanced purchase requirement. For 2001, November fares are also provided, to indicate what, if any, effect changes after 9/11 may have had on air fares in 2001.
## QFNZ-2 Fare Analysis

### Return Fares (Air Canada Only)

Source: ATPCO (accessed 11 March 2004)

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## QFNZ-2 Fare Analysis
### Return Fares (Air Canada Only)
**Source:** ATPCO (accessed 11 March 2004)

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**Legend**

- 7D = 7-day advance purchase
- 14D = 14-day advance purchase
- 3D = 3-day advance purchase
- 1ST SUN = return travel must commence no earlier than the first Sunday after departure from fare origin
- 3D or 1ST SUN = return travel must commence no earlier than 3 days after departure from fare origin
- OR originating FRI through SAT return travel must commence no earlier than the first Sunday after departure from fare origin
- N/A = not available

In 2003 Air Canada did not operate between Calgary - Winnipeg and Edmonton - Vancouver. Zip airlines operated these routes instead.
Appendix O: Intentionally left blank

Appendix O is intentionally left blank so as not to confuse letter O with number 0
Appendix P: Regression Results for Section 6.5 (European data)
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<td>Model 2</td>
<td>Model 3</td>
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14 April 2004
Confidential Appendix Q: Average fares on Qantas domestic routes, 1997-2003
[Confidential information.]
Appendix R:
List of Airline Alliances
Global Airline Alliances

<table>
<thead>
<tr>
<th>STAR ALLIANCE</th>
<th>Current Members</th>
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<tbody>
<tr>
<td></td>
<td>Air Canada</td>
</tr>
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<td></td>
<td>Air New Zealand</td>
</tr>
<tr>
<td></td>
<td>All Nippon Airways</td>
</tr>
<tr>
<td></td>
<td>Asiana Airlines (joined March 2003)</td>
</tr>
<tr>
<td></td>
<td>Austrian Airlines</td>
</tr>
<tr>
<td></td>
<td>BMI British Midland</td>
</tr>
<tr>
<td></td>
<td>LOT Polish Airlines (joined October 2003)</td>
</tr>
<tr>
<td></td>
<td>Lufthansa</td>
</tr>
<tr>
<td></td>
<td>Mexicana Airlines(^{184})</td>
</tr>
<tr>
<td></td>
<td>SAS Scandinavian Airlines</td>
</tr>
<tr>
<td></td>
<td>Singapore Airlines</td>
</tr>
<tr>
<td></td>
<td>Spanair (joined April 2003)</td>
</tr>
<tr>
<td></td>
<td>Thai Airways International</td>
</tr>
<tr>
<td></td>
<td>United Airlines</td>
</tr>
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<td>Varig Brazilian Airlines</td>
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<table>
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<tr>
<th>oneWorld ALLIANCE</th>
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<tr>
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<td>American Airlines</td>
</tr>
<tr>
<td></td>
<td>British Airways</td>
</tr>
<tr>
<td></td>
<td>Cathay Pacific Airways</td>
</tr>
<tr>
<td></td>
<td>Finnair</td>
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<td></td>
<td>Iberia</td>
</tr>
<tr>
<td></td>
<td>LAN Chile</td>
</tr>
<tr>
<td></td>
<td>Qantas Airways</td>
</tr>
<tr>
<td></td>
<td>Swiss International Airlines (joined September 2003)</td>
</tr>
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</table>

\(^{184}\) terminated 31 March 2004
<table>
<thead>
<tr>
<th>SkyTeam ALLIANCE</th>
<th>AeroMexico</th>
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<tr>
<td></td>
<td>Air France</td>
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<tr>
<td></td>
<td>Alitalia</td>
</tr>
<tr>
<td></td>
<td>Czech Airlines</td>
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<td></td>
<td>Delta Airlines</td>
</tr>
<tr>
<td></td>
<td>Korean Air</td>
</tr>
<tr>
<td>WINGS</td>
<td>Continental Airlines</td>
</tr>
<tr>
<td></td>
<td>KLM-Royal Dutch Airlines-</td>
</tr>
<tr>
<td></td>
<td>(will join SkyTeam Alliance)</td>
</tr>
<tr>
<td></td>
<td>Northwest Airlines</td>
</tr>
</tbody>
</table>
Other Airline Alliances

See attached list of alliances by carrier and type.
Source: Airline Business, July 2003
OK, hand's up who's not using OAG data?

In a world where the most up-to-date and comprehensive information is crucial to business success, you can rely on OAG data. We analyse, verify, manage and distribute schedules information for over 900 of the world's airlines.

Our wide range of services includes data supply for the major global distribution systems and airline reservation systems; delivering content for e-portals; and providing in-depth market analysis to the airline and wider aviation industry.

So if the most accurate data is important to you and your business, you need to get your hands on the world's leading source of flight information: OAG data.

To find out more about our growing service portfolio, please contact us at dataservices@oag.com or visit our website www.oagdata.com
Notes to the Airline alliance survey

This survey covers more than 140 alliances, including major international and regional agreements, as well as smaller regional ones. It is based on publicly available information and data from various sources.

Airlines included: The survey covers the most significant airline alliances as of June 2003.

Sources: Data for this survey is primarily from publicly available sources, including airline websites, industry reports, and various media outlets.

Dates: The data is as of June 2003.

Exclusions: The survey does not cover all alliances, especially those that are considered to be minor agreements or those that are not publicly disclosed.

Data collection: Data for this survey is based on airline websites and industry reports. The survey covers the most significant alliances as of June 2003.

Online access: The survey is available online at www.airlinebusiness.com.

Alliance network comparison – weekly scheduled data summer 2003

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Destinations served</th>
<th>Frequency (thousands)</th>
<th>Capacity (ASK million)</th>
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<tbody>
<tr>
<td>Star</td>
<td>673</td>
<td>72</td>
<td>1,609</td>
</tr>
<tr>
<td>Oneworld</td>
<td>561</td>
<td>136</td>
<td>369</td>
</tr>
<tr>
<td>SkyTeam</td>
<td>496</td>
<td>115</td>
<td>251</td>
</tr>
<tr>
<td>Total</td>
<td>1,795</td>
<td>1,121</td>
<td>2,245</td>
</tr>
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</table>

Notes: Data is based on published schedules for the summer 2003 season.

Alliance survey 2003 – current agreements by type and start date

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<tr>
<th>Alliance</th>
<th>North American</th>
<th>Asia-Pac</th>
<th>Europe-Asia-Pacific</th>
<th>Europe-Europe</th>
<th>Europe-N America</th>
<th>Europe-Latin America</th>
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<tr>
<td>Star</td>
<td>19</td>
<td>31</td>
<td>21</td>
<td>2</td>
<td>16</td>
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<tr>
<td>Oneworld</td>
<td>13</td>
<td>20</td>
<td>27</td>
<td>1</td>
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<td>5</td>
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<tr>
<td>SkyTeam</td>
<td>10</td>
<td>17</td>
<td>18</td>
<td>2</td>
<td>6</td>
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Capacity breakdown by region July 2003

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<th>Region</th>
<th>ASK mil</th>
<th>Share</th>
<th>Capacity</th>
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<td>North America</td>
<td>3,200</td>
<td>35.9%</td>
<td>2,508</td>
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<tr>
<td>Latin America</td>
<td>3,200</td>
<td>27.1%</td>
<td>2,050</td>
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<tr>
<td>Europe</td>
<td>3,200</td>
<td>27.1%</td>
<td>2,050</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>3,200</td>
<td>27.1%</td>
<td>2,050</td>
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Airline alliance survey 2003

The Airline Business Alliance Survey provides a snapshot of the current state of co-operation deals between the world’s main carriers. The survey focuses on those mainline scheduled passenger carriers which appear in the top 200 traffic ranking. This excludes regional and charter partners, as well as cargo agreements, which are covered in other Special Reports throughout the year. Links which only extend to a frequent flyer programme (FFP) are not included. Membership of the main global alliances – oneworld, SkyTeam and Star – are indicated to the right of the name bar and have not been included in their right in the listing unless a specific bilateral exists. Full details of the global groupings are given on the preceding pages. Data for the listing was compiled in association with Airline Business by sister online service Air Transport Intelligence (www.rati.com).

Adria Airways
Parent shareholders: Development Corporation of Slovenia (State Owned) 75%, Slovenian Investment Funds 16%
Airline codeshare on Ljubljana airport on Ljubljana
Austrian Airlines
Croatia Airlines
El Al
Lufthansa

Oneworld

Parent shareholders: State government 55%, Employees 5%
British Airways
Cathay Pacific
Emirates
Iberia Airlines
KLM Royal Dutch Airlines
Lufthansa
Qantas

SkyTeam

Parent shareholders: Air France
ARL
British Airways
Cathay Pacific
Emirates
Iberia Airlines
KLM Royal Dutch Airlines
Lufthansa

Star Alliance

Parent shareholders: Air France
Aerolineas Argentinas
British Airways
Cathay Pacific
Emirates
Iberia Airlines
KLM Royal Dutch Airlines
Lufthansa

Russian Airlines

Parent shareholders: Russian government 51%, Carole Trading firm 49%
<table>
<thead>
<tr>
<th>Alliance</th>
<th>Survey</th>
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<tr>
<td>Lufthansa</td>
<td>Aug 2002</td>
</tr>
<tr>
<td>Codeshare on Frankfurt-Moscow.</td>
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<tr>
<td>AirEuropa</td>
<td>Apr 2002</td>
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<tr>
<td>Codeshare on Budapest-Moscow.</td>
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<tr>
<td>Royal Jordanian Airlines</td>
<td>Jul 1998</td>
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<td>Codeshare on Amman-Moscow.</td>
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<tr>
<td>Scandinavian Airlines</td>
<td>Apr 1967</td>
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<tr>
<td>Pool agreement on Stockholm, Oslo, Copenhagen-Moscow.</td>
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<tr>
<td>Scandinavian Airlines</td>
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<tr>
<td>Codeshare on Shannon, Dublin-Moscow.</td>
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<tr>
<td>TAROM</td>
<td>Oct 1997</td>
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<tr>
<td>Blocked space codehare on Bucharest-Moscow.</td>
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<tr>
<td>Turkish Airlines</td>
<td>Feb 2003</td>
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<tr>
<td>Codeshare on Istanbul-Moscow.</td>
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**Aerolíneas Argentinas**

**Parent/Shareholders:**
- Air Europe
- Royal Jordanian Airlines
- Scandinavian Airlines

**Codeshare:**
- Buenos Aires
- Lima
- Lima
- Lima
- Lima

**SkyTeam**

**Arménia**

**Parent/Shareholders:**
- AirEuropa
- Iberia

**Codeshare:**
- Madrid

**Avianca**

**Parent/Shareholders:**
- Avianca
- Copa Airlines
- LAN Airlines
- TAM Airlines

**Codeshare:**
- Bogota
- Medellin
- Lima
- Rio de Janeiro

**Avianet Airlines**

**Parent/Shareholders:**
- Avianca
- Copa Airlines
- LAN Airlines
- TAM Airlines

**Codeshare:**
- Bogota
- Medellin
- Lima
- Rio de Janeiro

**Airbus**

**Parent/Shareholders:**
- AirEuropa
- Air France-KLM
- Alitalia
- Air Berlin

**Codeshare:**
- Madrid
- Paris
- Rome
- Berlin

**Air Austral**

**Parent/Shareholders:**
- Air France

**Codeshare:**
- Montevideo

**Air europa**

**Parent/Shareholders:**
- Air europa

**Codeshare:**
- Madrid

**Air Inter**

**Parent/Shareholders:**
- Air France

**Codeshare:**
- Bordeaux

**Air Mediterranea**

**Parent/Shareholders:**
- Air Inter

**Codeshare:**
- Nice

**AirOne**

**Parent/Shareholders:**
- Air Inter

**Codeshare:**
- Milan
<table>
<thead>
<tr>
<th>Alliance</th>
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<tr>
<td><strong>Parent/Shareholders:</strong></td>
<td><strong>Shareholdings</strong></td>
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</table>
| **French State 55.9%**, **Publicly held 37%,** **Airtours 5%,** **Air France 5%,** **Air Inter 5%**, **Air Mauritius 5%**, **Air Namibia 5%**, **Air New Zealand 5%**, **Air Tahiti Nui 5%**, **Air India 5%**, **Air Afrique 5%**, **Air Europe 5%**, **Air Italia 5%**, **Air Malta 5%**, **Air Mauritius 5%**, **Air Seychelles 5%**, **Air Nippon Airways 5%**, **Air Philippines 5%**, **Air Union 5%**, **Air Partner 5%**, **Air France 5%**, **Air Inter 5%**
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<td>1990</td>
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<tr>
<td>Seychelles Airlines</td>
<td>1999</td>
</tr>
<tr>
<td>Air France</td>
<td>Oct 1997</td>
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<tr>
<td>Air Malta</td>
<td>Nov 1997</td>
</tr>
<tr>
<td>French Polynesian Airlines</td>
<td>Nov 2000</td>
</tr>
<tr>
<td>Qantas Airways</td>
<td>May 2000</td>
</tr>
<tr>
<td>Air Tanzania</td>
<td>Government of Tanzania 51%, South African Airways 49%</td>
</tr>
<tr>
<td>Kenya Airways</td>
<td>Nov 2001</td>
</tr>
<tr>
<td>Air Malawi</td>
<td>Government of Vanuatu 100%</td>
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<tr>
<td>Air Pacific</td>
<td>Apr 1999</td>
</tr>
<tr>
<td>Qantas Airways</td>
<td>Oct 1993</td>
</tr>
<tr>
<td>Solomon Airlines</td>
<td>Apr 1999</td>
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<tr>
<td>Air Zimbabwe</td>
<td>Government of Zimbabwe 100%</td>
</tr>
<tr>
<td>Air Mauritius</td>
<td>1997</td>
</tr>
<tr>
<td>Air Mauritius</td>
<td>Government owned 100%</td>
</tr>
<tr>
<td>Air France</td>
<td>Aug 2000</td>
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<tr>
<td>Air France</td>
<td>1997</td>
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<td>Air Mauritius</td>
<td>Apr 1996</td>
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<td>Air Mauritius</td>
<td>Mar 1999</td>
</tr>
<tr>
<td>Asiana Airlines</td>
<td>Oct 1997</td>
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<tr>
<td>Emirates</td>
<td>Sep 2000</td>
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<td>Gulf Air</td>
<td>Jun 1999</td>
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<td>Indian Airlines</td>
<td>Dec 1993</td>
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<td>Kawai Airways</td>
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<td>EVA Air</td>
<td>Oct 1993</td>
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<td>SN Brussels Airlines</td>
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<td>TACA International Airlines</td>
<td>1996</td>
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<td>TAM Linhas Aereas</td>
<td>Aug 1997</td>
</tr>
<tr>
<td>THY Turkish Airlines</td>
<td>Oct 2000</td>
</tr>
</tbody>
</table>

**Alaska Airlines**

**Parent/Shareholders:**

- Joint venture between Alaska Airlines and Virgin Atlantic Airways.

**Code-share partners:**

- Aeromexico
- Alaska Airlines
- American Airlines
- Delta Air Lines
- Virgin Atlantic Airways

**Code-share agreements:**

- Code-share on flights between the USA and Mexico.

**Notes:**

- Joint venture co-operation agreement.

**United Airlines**

**Parent/Shareholders:**

- Joint venture between United Airlines and Virgin Atlantic Airways.

**Code-share partners:**

- British Airways
- Delta Air Lines
- Virgin Atlantic Airways

**Code-share agreements:**

- Code-share on flights between the USA and the UK.

**Notes:**

- Joint venture co-operation agreement.

**Lufthansa**

**Parent/Shareholders:**

- Joint venture between Lufthansa and Virgin Atlantic Airways.

**Code-share partners:**

- American Airlines
- Delta Air Lines
- United Airlines

**Code-share agreements:**

- Code-share on flights between the USA and Germany.

**Notes:**

- Joint venture co-operation agreement.
<table>
<thead>
<tr>
<th>Country</th>
<th>Airlines</th>
<th>Parent/Shareholders</th>
<th>Shareholdings</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Garuda</td>
<td>President/Shareholders:</td>
<td>Iberia Airlines 9%, Air Mauritius 3.84%, Qantas Airways 18.93%, Comair 18%, British Airways CityExpress 100%, CityExpress 100%, Deutsche BA 100%, Monarch Airlines 100%</td>
<td>Joint Services on Singapore to Lombok and Makassar</td>
</tr>
<tr>
<td>China</td>
<td>China Eastern Airlines</td>
<td>Parent/Shareholders:</td>
<td>Publicly held 100%</td>
<td>own website</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shareholdings:</td>
<td>Iberia Airlines 9%, Air Mauritius 3.84%, Qantas Airways 18.93%, Comair 18%, British Airways CityExpress 100%, CityExpress 100%, Deutsche BA 100%, Monarch Airlines 100%</td>
<td>Codelcohead and oneworld alliance partner</td>
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### Alliances

<table>
<thead>
<tr>
<th>Alliances</th>
<th>Survey</th>
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<tbody>
<tr>
<td>Thai Airways</td>
<td>Oct 1994</td>
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<tr>
<td>Emitas</td>
<td>Feb 1992</td>
</tr>
</tbody>
</table>

#### Parent/Shareholders:

- **Thai Airways**
  - March 1994, government of Thailand 34.4%
  - Cemco AS 17%

- **Thai Airways**
  - Feb 1997, codeshare on Tallinn-Kiev.
  - March 1999, codeshare on Tallinn to Copenhagen, Oslo and Stockholm.

- **Thai Airways**
  - April 1994, Evergreen Marine Corp 25.33%
  - Evergreen International Corp 13.5%
  - Air Macau 5%, UNI Air Corp 18%
  - Air Canada 2000, codeshare on Vancouver-Tokyo.
  - Feb 1995, codeshare on Tallinn-Auckland.

- **Thai Airways**
  - Jan 1999, codeshare on Tallinn to Paris.
  - Dec 1994, codeshare on Tokyo to Seoul.
  - July 1993, codeshare on Tallinn to London.

- **Thai Airways**
  - Apr 1994, codeshare on Tallinn to Paris.
  - July 1993, codeshare on Tallinn to Copenhagen.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Jan 1999, codeshare on Tallinn to Amsterdam.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Apr 1994, codeshare on Tallinn to Paris.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Jan 1999, codeshare on Tallinn to Amsterdam.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Apr 1994, codeshare on Tallinn to Paris.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Jan 1999, codeshare on Tallinn to Amsterdam.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.

- **Thai Airways**
  - Apr 1994, codeshare on Tallinn to Paris.
  - July 1993, codeshare on Tallinn to Paris.
  - Feb 1995, codeshare on Tallinn to Paris.
<table>
<thead>
<tr>
<th>Alliances</th>
<th>Survey</th>
<th>Code on Flights</th>
</tr>
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**Global Airlines:****


**Domestic Airlines:**

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<tr>
<th>Airline</th>
<th>Code on Flights</th>
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<tbody>
<tr>
<td>Malayan Airlines</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Lithuanian Airlines</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Ethiopian Airlines</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Air Canada</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>KLM Royal Dutch Airlines</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
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<tr>
<td>Lufthansa</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Finnair</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Iberia</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
</tr>
<tr>
<td>Virgin Atlantic Airways</td>
<td>Code on flights between Poland and Germany. Star Alliance partner from Oct 2003.</td>
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<tr>
<td>ANA</td>
<td>1988</td>
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<tr>
<td>Delta Air Lines</td>
<td>1995</td>
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<tr>
<td>Hawaiian Airlines</td>
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<td>Malaysia Airlines</td>
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<td>Air New Zealand</td>
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<td>Alliances</td>
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<td>American Airlines</td>
<td>Nov 1989</td>
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<tr>
<td>British Airways</td>
<td>Mar 1993</td>
</tr>
<tr>
<td>Code-share marketing agreement. Qantas and its global alliance partner British Airways entered into a comprehensive 10-year marketing agreement in 1993. Customers benefit from global fare promotions, increased round-the-world fares, reciprocal frequent flyer programs, reciprocal lounge access, a program to develop joint lounges, global freight co-operation, worldwide alliance.</td>
<td></td>
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<tr>
<td>China Eastern Airlines</td>
<td>Oct 2002</td>
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<tr>
<td>Blocked space code-share on Sydney to Shenzhen and Beijing.</td>
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<tr>
<td>EVA Air</td>
<td>May 2000</td>
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<tr>
<td>Blocked space code-share on Sydney-Taipei.</td>
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<tr>
<td>Finnair</td>
<td>Jun 2003</td>
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<tr>
<td>Freesat on Singapore-Bangkok. Also on Sydney to Bangkok and Helsinki. World alliance partner.</td>
<td></td>
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<tr>
<td>Gulf Air</td>
<td>Apr 2002</td>
</tr>
<tr>
<td>Freesat on Singapore to Melbourne and Sydney. Qantas operating.</td>
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<tr>
<td>Japan Airlines</td>
<td>Jul 2002</td>
</tr>
<tr>
<td>Code-share on SilkAir-Carn, Qantas operating, Tokyo to Brisbane and Melbourne. Qantas to Brisbane and Sydney. JAL operating.</td>
<td></td>
</tr>
<tr>
<td>LaoChine</td>
<td>Oct 1999</td>
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<tr>
<td>Blocked space code-share on Auckland to Shanghai, Melbourne and Aqsa, and Sydney-Apia.</td>
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<tr>
<td>South African Airways</td>
<td>Jan 2003</td>
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<tr>
<td>Blocked space code-share on Johannesburg to Sydney and Perth.</td>
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<td>Vietnam Airlines</td>
<td>Mar 1998</td>
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<tr>
<td>Code-share on SilkAir, China Airlines. World alliance partner.</td>
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<tr>
<td>Government of Qatar.</td>
<td></td>
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<tr>
<td>Privately held 50%.</td>
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<tr>
<td>Code-share on Doha- lhaka. Qatar operating.</td>
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</tr>
<tr>
<td>Code-share on Dohto-lahja. Qatar operating.</td>
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<tr>
<td>Code-share on Muscat-Dubai. Lufthansa operating.</td>
<td></td>
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<tr>
<td>Cross participation of FFP.</td>
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<tr>
<td>Code-share on Doha-Kuala Lumpur. Doha operating.</td>
<td></td>
</tr>
<tr>
<td>Code-share on Doha-Manila. Qatar operating.</td>
<td></td>
</tr>
<tr>
<td>Moroccan government 92.9%, Air France 2.8%. Ibena Airlines 1.3%. Air Senegal International 51%. Joint purchasing plans for code-share on routes such as Algiers-Sharjah. Possibility of developing joint long-haul routes.</td>
<td></td>
</tr>
<tr>
<td>Agreement, schedule co-operation and code-share on France to Morocco (except Marrakech).</td>
<td></td>
</tr>
<tr>
<td>United States and Western Europe.</td>
<td></td>
</tr>
<tr>
<td>Code-share on New York-Casablanca and Beyond, RAM operating, several beyond New York routes, Delta operating.</td>
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<tr>
<td>Code-share on Abu Dhabi-Algeria.</td>
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<tr>
<td>Government of Brunei Darussalam 100%. Joint services on Hong Kong-Bangkok-Singapore between.</td>
<td></td>
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<tr>
<td>Code-share on Kuala Lumpur-Bandar Seri Begawan.</td>
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<tr>
<td>Code-share on Kuala Lumpur-Bandar Seri Begawan.</td>
<td></td>
</tr>
<tr>
<td>Jordan state-owned 100%. Royal Wings Airlines 100%. Code-share on Amman-Moscow. Reciprocal code-share manual block agreement on London-Amman, Royal Jordanian operating, and London to Toronto and Montreal, Air Canada operating.</td>
<td></td>
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<tr>
<td>Code-share on Vienna-Brussels.</td>
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<td>Code-share on Madrid-Amman.</td>
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<tr>
<td>Code-share on Kuala Lumpur-Amman.</td>
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<tr>
<td>Code-share on Colombo-Amman, Royal Jordanian operating.</td>
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<tr>
<td>Code-share on Amman-Qatar.</td>
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<tr>
<td>Code-share on Amman-Bangkok.</td>
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<tr>
<td>Government of Tonga 100%. Code-share on services between Tonga and Fiji. Code-share on Tonga-Hong, Polynesian Airlines operating.</td>
<td></td>
</tr>
<tr>
<td>Saudi government 100%. Revenue poggings on Pakistan-Saudi Arabia.</td>
<td></td>
</tr>
<tr>
<td>SAS Group 100%. SAS Cargo 100%, SAS Commuter 100%, Snowflake 100%. Pool agreement on Moscow to Stockholm, Oslo and Copenhagen. Reciprocal code-share/feeder agreement covering both partners' networks. Star Alliance partner.</td>
<td></td>
</tr>
<tr>
<td>Code-share marketing agreement. Star Alliance partner.</td>
<td></td>
</tr>
<tr>
<td>Reciprocal code-share on covering specific routes across both partners' networks. Joint venture code-share agreement.</td>
<td></td>
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<tr>
<td>Airlines</td>
<td>Survey</td>
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<tr>
<td>Malaysia Airlines</td>
<td>Oct 1997</td>
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<td>Carnation Airlines</td>
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<td>Singapore Airlines</td>
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<td>Swiss</td>
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<td>United Airlines</td>
<td>Feb 2001</td>
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<td>SkyTeam Airlines</td>
<td>Feb 2000</td>
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</tbody>
</table>

**Alliances**

<table>
<thead>
<tr>
<th>Parent/Shareholders</th>
<th>Shareholdings</th>
<th>Market share</th>
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</thead>
<tbody>
<tr>
<td>Air China</td>
<td>Jun 2002</td>
<td>50%</td>
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<tr>
<td>Air New Zealand</td>
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**Parent/Shareholders**

<table>
<thead>
<tr>
<th>Airlines</th>
<th>Survey</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia Airlines</td>
<td>Oct 1997</td>
<td>USA, Thailand, Asia Pacific/Australia. Star Alliance partner.</td>
</tr>
<tr>
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<td>Feb 2000</td>
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</tr>
<tr>
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**Alliances**

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<tr>
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<th>Shareholdings</th>
<th>Market share</th>
</tr>
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<tbody>
<tr>
<td>Air China</td>
<td>Jun 2002</td>
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</table>
Appendix S:
List of FSA Subsidiary Carriers and Brands
## Selected Low Fare Subsidiaries of Full Service Network Carriers

<table>
<thead>
<tr>
<th>Airline</th>
<th>Subsidiary</th>
<th>Started</th>
<th>Rationale</th>
<th>Status</th>
<th>Aircraft Types</th>
<th>Subsidiary / Brand*</th>
<th>Replacement Capacity/, new markets or Cannibalisation*</th>
<th>Terminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>Continental Lite</td>
<td>1993</td>
<td>Launched to compete directly with Southwest Short-haul flights Hubs: Houston, IAH; Newark; Cleveland</td>
<td>Suffered considerable losses. Terminated.</td>
<td>DC9</td>
<td>Subsidiary</td>
<td>Cannibalised connecting traffic</td>
<td>Terminated in 1995</td>
</tr>
<tr>
<td>United</td>
<td>Shuttle by United</td>
<td>October 1994</td>
<td>Developed as competitive response to Southwest entry on West Coast routes Hubs: Denver; Los Angeles; San Francisco; Seattle</td>
<td>Started with a target of matching SW route for route. United eventually pulled out of secondary airport markets served by Southwest (e.g., Oakland-San Diego) and</td>
<td>Boeing 737</td>
<td>Subsidiary</td>
<td>New markets, then Replacement</td>
<td>Terminated in November 2001 as Shuttle by United's new costs mirror the parent company's costs.</td>
</tr>
</tbody>
</table>
### Selected Low Fare Subsidiaries of Full Service Network Carriers

<table>
<thead>
<tr>
<th>Airline</th>
<th>Subsidiary</th>
<th>Started</th>
<th>Rationale</th>
<th>Status</th>
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<th>Subsidiary / Brand*</th>
<th>Replacement Capacity, new markets or Cannibalisation*</th>
<th>Terminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air New Zealand</td>
<td>Freedom Air</td>
<td>1995</td>
<td>Based in Auckland. Mainly service between New Zealand &amp; Australia, recently added Fiji. Potentially to contain growth of New Zealand start-ups, such as Kiwi.</td>
<td>Operating</td>
<td>Boeing 737-300</td>
<td>Subsidiary</td>
<td></td>
<td>operating</td>
</tr>
<tr>
<td>Delta</td>
<td>Delta Express</td>
<td>October 1996</td>
<td>Orlando, Florida</td>
<td>Terminated</td>
<td>Boeing 737-200</td>
<td>Brand</td>
<td>New routes, but cannibalised connecting traffic</td>
<td>Terminated 2001</td>
</tr>
<tr>
<td>Airline</td>
<td>Subsidiary</td>
<td>Started</td>
<td>Rationale</td>
<td>Status</td>
<td>Aircraft Types</td>
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<td>-----------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Air Canada</td>
<td>Tango</td>
<td>October 2001</td>
<td>AC’s attempt to limit growth by Canada 3000 Potentially to create perception of</td>
<td>Terminated.</td>
<td>A320</td>
<td>Brand</td>
<td>Cannibalisation</td>
<td>Terminated (Tango is now the name of AC’s lowest internet fare class)</td>
</tr>
</tbody>
</table>
## Selected Low Fare Subsidiaries of Full Service Network Carriers

<table>
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<th>Terminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>BMibaby</td>
<td>January 2002</td>
<td>Based at East Midlands Airport, Hubs: East Midlands</td>
<td>Operating</td>
<td>Boeing 737-300</td>
<td>Subsidiary</td>
<td>New routes</td>
<td>Operating</td>
</tr>
<tr>
<td>Air Canada</td>
<td>Zip</td>
<td>September 2002</td>
<td>Subsidiary – targeted primarily at WestJet routes. Minor work/wage concessions relative to mainline employees.</td>
<td>Operating</td>
<td>Boeing 737-200</td>
<td>Subsidiary</td>
<td>Some replacement, some cannibalisation</td>
<td>New carrier</td>
</tr>
<tr>
<td>SAS Scandinavian Airlines</td>
<td>Snowflake</td>
<td>March 2003</td>
<td>Flies to 17 European destinations out of Stockholm &amp; Copenhagen.</td>
<td>Operating</td>
<td>Boeing 737-800</td>
<td>Brand</td>
<td>Mixed</td>
<td>Operating</td>
</tr>
<tr>
<td>Delta</td>
<td>Song</td>
<td>April 2003</td>
<td>Launched to contain Southwest in Florida and Northeast USA.</td>
<td>Expansion on hold pending review of business units at Delta.</td>
<td>Boeing 757</td>
<td>Brand</td>
<td>Cannibalisation. Expansion under review</td>
<td>New carrier</td>
</tr>
</tbody>
</table>

* Cannibalisation refers to the practice of a company diverting airline resources to its own domestic or regional operations, often at the expense of the parent company's international operations.

** Subsidiary indicates a company that is owned and controlled by another company, typically a larger parent company, which provides it with resources and support to operate independently.

* Capacity refers to the number of seats or flights available for sale, which is a key indicator of an airline's market presence and strategic focus.
<table>
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<tr>
<th>Airline</th>
<th>Subsidiary</th>
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<tbody>
<tr>
<td>United</td>
<td>Ted</td>
<td>Feb 2004</td>
<td>Denver-based brand to be used primarily on leisure routes with simplified fare structure</td>
<td>Operating</td>
<td>Airbus A320</td>
<td>Brand</td>
<td>Intended mainly as replacement for mainline services, but in fact is operating on routes along with United.</td>
<td>New carrier</td>
</tr>
<tr>
<td>Qantas Airways</td>
<td>Jetstar</td>
<td>May 2004</td>
<td>Based in Melbourne to compete with Virgin Blue on domestic routes. Will concentrate on growing the leisure market with value fares while opening up new destinations.</td>
<td>Planned</td>
<td>Boeing 717-200, A320-200</td>
<td>Subsidiary</td>
<td>Some routes are replacement, while on others, Jetstar will operate alongside Qantas</td>
<td>May 2004 start</td>
</tr>
<tr>
<td>Singapore</td>
<td>Tiger</td>
<td>Planned</td>
<td>Joint venture</td>
<td>Planned</td>
<td></td>
<td>Subsidiary</td>
<td>Unclear</td>
<td>Planning stage</td>
</tr>
<tr>
<td>Airline</td>
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<td>------------</td>
</tr>
<tr>
<td>Airlines Airways</td>
<td>Airways</td>
<td>for 2nd quarter 2004</td>
<td>between Singapore Airline and three foreign partners in response to growth of Air Asia and planned ValuAir start-up.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
### Selected Long Haul Charter Type Subsidiaries of FSAs

<table>
<thead>
<tr>
<th>Airline</th>
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<th>Aircraft Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>KLM</td>
<td>Basiq Air/Transavia</td>
<td>Owns 80% stake in Transavia, which operates flights for low cost carrier Basiq Air.</td>
<td>Operating</td>
<td>737-700/800</td>
</tr>
<tr>
<td>KLM</td>
<td>Martinair</td>
<td>Owns 50% stake. KLM feeds Martinair flights at AMS.</td>
<td>Operating</td>
<td>747, MD-11, 767, A320</td>
</tr>
<tr>
<td>Lufthansa</td>
<td>Condor</td>
<td>Owns 10% stake. Charter operation. Operates flights for Thomas Cook (Lufthansa owns 10% stake in Thomas Cook)</td>
<td>Operating</td>
<td>757, 767, A320</td>
</tr>
<tr>
<td>Lufthansa</td>
<td>Eurowings</td>
<td>Lufthansa purchased 24.9% stake in Eurowings. Eurowings owns 100% of Germanwings.</td>
<td>Operating</td>
<td>ATR aircraft, BAe aircraft and CRJ aircraft</td>
</tr>
<tr>
<td>Qantas</td>
<td>Australian Airlines</td>
<td>No frills charter-type operation for long haul international services.</td>
<td>Operating</td>
<td>Boeing 767</td>
</tr>
</tbody>
</table>
# Glossary

**ASK**  
*or Available Seat Kilometres*  
A measure of airline capacity. ASM can be computed for a specific flight, a schedule flight over a period of time, an aircraft type, or for an entire airline network. A flight’s number of ASMs is equal to the number of seats on the aircraft times the miles flown. A standard mileage is used for each city-pair rather than actual mileage flown, which can vary somewhat from flight to flight.  

\[ \text{ASM} = \text{No. of seats} \times \text{Miles} \]

Consider the stage length between Toronto YYZ and Moncton YQM, which is 751 miles. A flight using a 737-200 (with 100 seats) would have 75,100 ASMs for each individual one way flight (100 seats × 751 miles).

**Average Fare**  
The numerical average of all fares paid or offered on a route or at an airport. In some research, separate averages are calculated for different fare classes or airlines.

**Booking class**  
Means a collection of fares, usually identified by a letter (e.g., booking class L).  

- **Y** is the letter assigned by most airlines to unrestricted economy fares  
- **J** is the letter assigned by many airlines to unrestricted business class fares

**Break-even load factor (abbreviated BELF)**  
The load factor needed for an airline to break even on a flight. Calculation of BELF requires assumptions on the average revenue per passenger.

**CASM**  
Costs per Available Seat Mile. Usually expressed in cents. CASM can be computed for a specific flight, a schedule flight over a period of time, an aircraft type, or for an entire airline network.  

\[ \text{CASM} = \frac{\text{Cost}}{\text{ASM}} \]

Example: a 737-200 flying from Moncton to Toronto with costs of
$12,000 and 100 seats:

\[
ASM = 100 \text{ seats} \times 751 \text{ miles} = 75,100
\]

\[
CASM = \frac{12,000}{75,100} = 15.9 \, \text{¢}
\]

See ASM; RPM; Load Factor; Yield

City-pair
The combination of an origin and destination city. The term can be used in reference to a passenger’s trip origin and destination, or the carrier’s beginning and end points for a flight segment.

Code sharing
A marketing practice whereby one air carrier’s identifier code is placed on a flight operated by another air carrier, for purposes of display on the Computer Reservation System (CRS).

Computer reservation system (CRS)
The electronic data management system that allows airlines and travel agents to make flight reservations on most scheduled airlines. It is also used by airlines to control the price and booking status of each seat on each flight. Airfare information is also distributed to global distribution systems (GDS) such as Amadeus/System One, Galileo International, Sabre, and Worldspan.

Factor cost
This is a term of art in economics. It refers the costs of individual factors of production: labour, capital, fuel, and materials. A reduction in wage rates, for example, is referred to as a reduction in factor prices, hence a reduction in factor costs.

Fare
Means the price of a ticket and its associated restrictions or characteristics.

Fareclass
A tariff which establishes a price at which a ticket may be purchased along with a set of conditions on the purchase or use of the ticket. Examples of such conditions (or fences) may include required advanced purchase a certain number of days in advance, required minimum or maximum stays, whether or not refundable, ability to make changes to flight dates or times, etc. Fareclasses are often grouped together with similar but subtle differences between them. For example the L group (the L fareclass) may consist of a specific L14EAST sub-fareclass as well as LAC and other fareclasses, which differ slightly from each other or in terms of which markets they are available in. Fare subclasses are sometimes referred to with the term “fare basis code” or “fare type”.

14 April 2004
Fences  A set of conditions or restrictions on the purchase or use of the ticket. Examples of such conditions (or fences) may include required advanced purchase a certain number of days in advance, required minimum or maximum stays, whether or not refundable, ability to make changes to flight dates or times, etc. Fences are used to segment the consumers in a market into different groups based on their willingness or ability to pay high fares.

Flight segment  A particular sector on a multi-leg itinerary. For example, Moncton-Toronto is a flight segment on a passenger trip from Moncton to North Bay, via a connection in Toronto. The term ‘flight segment’ may also apply to an itinerary of a specific aircraft. For example, aircraft CAGN might fly a Moncton-Toronto segment on an itinerary which would see the aircraft next fly Toronto-Kalamazoo, then Kalamazoo-Toronto, then Toronto-Ottawa, then Ottawa-Philadelphia, then Philadelphia-Toronto, … Each of these segments may have a unique flight number.

Hub and spoke system  A hub is an airport that an airline serves as the transfer point for the many routes it operates. The routes are defined as spokes. Certain times during the day known as ‘flight banks’ have a large number of flights arriving and departing in a short period of time so as to facilitate transfer of passengers between the spokes.

IATA  International Air Transport Association. This is an international industry facilitation organisation based in Montreal. It provides its member (as well as non-member) airlines with a range of facilitation and other services. An important and historic function of IATA is the world-wide interline system it facilitates, which allows travel agents and carriers to quote fares and sell tickets to millions of possible city pair combinations throughout the world.

Interline Fare  A fare offered for a multi-flight passenger trip involving connections from the flight of one carrier to the flight of another, independent carrier. Interline fares generally are lower than the combination fare, i.e., the sum of the fares for each separate flight segment involved in the passenger trip. Interline fares are a special type of through fare.

LF  See Load factor

Load factor  A percentage measure of actual passengers carried as a proportion of seat capacity. Passenger load factor equals the total number of passengers carried over the total available seat capacity flown by
Load factors can be measured for a single flight, route, airline or industry wide.

Frequently abbreviated as PLF (passenger load factor) or LF (load factor).

PLF for a flight is simply:

\[ \text{PLF} = \frac{\text{Revenue passengers}}{\text{Seats}} \]

Example: a 717 with 91 seats and 65 revenue passengers would have a PLF of 71.4% (65 ÷ 91).

Load factors computed system-wide measures will use RPM and ASM. Thus system-wide PLF is calculated as follows:

\[ \text{System wide PLF} = \frac{\text{total system RPM}}{\text{total system ASM}} \]

Network air carrier or network carrier

A term used for carriers which operate a large and co-ordinated network of individual routes. These carriers develop systems and operations which facilitate easy and convenient connections of passengers between different flights operated by the carrier or its owned, alliance or other partners. Network carriers typically offer the consumer a higher level of service attributes, such as service redundancy, frequent flyer reward programs, better in-flight service, business traveller lounges, etc.

RASM

Revenue per Available Seat Mile. Usually expressed in cents. RASM can be computed for a specific flight, a schedule flight over a period of time, an aircraft type, or for an entire airline network.

RASM is “a common industry measure of passenger revenue performance providing a yardstick of revenue generation per unit of capacity offered”.

\[ \text{RASM} = \frac{\text{Revenue}}{\text{ASM}} \]

Example: a 737-200 flying from Moncton to Toronto with revenues of $12,000 and 100 seats:

\[ \text{ASM} = 100 \text{ seats} \times 751 \text{ miles} = 75,100 \]

\[ \text{RASM} = \frac{12,000}{75,100} = 15.9 \text{ ¢} \]

See ASM; RPM; Load Factor; Yield
RPM  Means revenue passenger mile, which is equal to the number of passengers on a flight times the miles flown.

\[ \text{RPM} = \text{Pax} \times \text{Miles} \]

(The number of miles is based on a standard mileage for the city-pair.)

Example: a 737-200 flying from Moncton YQM to Toronto YYZ with 60 revenue passengers would have an RPM of 45,060 (60 \times 751).

Slot  The right to land or take off at an airport at a specified time.

Stage length  Is the published shortest great circle distance between two airports regardless of the flight plan distance actually operated. For instance, the stage length between Moncton and Toronto is 751 miles. Average stage length is simply the weighted average of an airlines entire route operation.

VFR  A passenger travelling for purposes of visiting friends and relatives. (It is also an acronym in flight operations for visual flight rules that means the aircraft is being flown without using instrument navigational aids.)

Walk up fare  An air fare which can be purchased at any time prior to the departure of a flight. As such, these fares do not have advance purchase restrictions or fences and typically are available to the late booking high willingness-to-pay air traveller.

Yield  The cents per mile that the airline receives for passenger tickets sold on its system. It is simply the revenue from the passenger divided by the distance, expressed in either kilometres or miles. Average yield can be expressed on a systemwide basis, by dividing all passenger revenue by the distance travelled by all passengers. A yield can be expressed on a route basis, or by flight or by different airfare.

\[ \text{Yield} = \frac{\text{Revenue}}{\text{RPM}} \]
# List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ACCC</td>
<td>Australia Consumer and Competition Commission</td>
</tr>
<tr>
<td>ASK</td>
<td>Available Seat Kilometres</td>
</tr>
<tr>
<td>ASM</td>
<td>Available Seat Miles</td>
</tr>
<tr>
<td>ATA</td>
<td>Air Transportation Association, a U.S. airline organisation.</td>
</tr>
<tr>
<td>ATA</td>
<td>A U.S. air carrier which previously provided intercontinental and continental destinations and now complementing these services with LCC service in regional markets in the U.S.</td>
</tr>
<tr>
<td>ATPCo</td>
<td>Airline Tariff Publishing Company</td>
</tr>
<tr>
<td>BSP</td>
<td>Bank Settlement Plan (IATA)</td>
</tr>
<tr>
<td>BTCE</td>
<td>Bureau of Transport and Communications Economics</td>
</tr>
<tr>
<td>CASM</td>
<td>Cost Per Available Seat Mile</td>
</tr>
<tr>
<td>CBO</td>
<td>Congressional Budget Office (U.S.)</td>
</tr>
<tr>
<td>DB1A</td>
<td>Data base 1A, a U.S. Department of Transportation Database which consists of a sample of 10% of all airline tickets sold in the U.S. There is both an international (largely only U.S. carriers) and a domestic version of the database, with only the latter being available without a confidentiality undertaking. The international data is not available to non-U.S. citizens or organisations, and these may not use the data for non-U.S. clients.</td>
</tr>
<tr>
<td>DJ</td>
<td>Two letter designation code for Virgin Blue</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation (U.S.)</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FSA</td>
<td>Full Service Carrier</td>
</tr>
<tr>
<td>FSNC</td>
<td>Full Service Network Carrier</td>
</tr>
<tr>
<td>GAO</td>
<td>General Accounting Office (U.S.)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>IATA</td>
<td>International Air Transport Association.</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
</tr>
<tr>
<td>JSA</td>
<td>Joint Services Agreement (between Qantas and British Airways)</td>
</tr>
<tr>
<td>LCC</td>
<td>Low Cost Carrier</td>
</tr>
<tr>
<td>LFA</td>
<td>Low Fare Carrier, a term used by Lawton, generally to denote an LCC</td>
</tr>
<tr>
<td>NECG</td>
<td>Network Economics Consulting Group</td>
</tr>
<tr>
<td>OAG</td>
<td>Official Airline Guide</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
</tr>
<tr>
<td>QF</td>
<td>Two letter designator code for Qantas</td>
</tr>
<tr>
<td>QSI</td>
<td>Quality Service Index</td>
</tr>
<tr>
<td>RPK</td>
<td>Revenue Passenger Kilometres</td>
</tr>
<tr>
<td>RPM</td>
<td>Revenue Passenger Miles</td>
</tr>
<tr>
<td>SAM</td>
<td>Single Aviation Market</td>
</tr>
</tbody>
</table>