

Statement of Dr. Michael W. Tretheway

25 July 2003

prepared for counsel

Table of Contents

1.0	Statement of Identity, Interest and Qualifications.....	1
	1.1 Statement of identity.....	1
	1.2 My qualifications to comment in this matter	1
	1.3 Statement of interest	4
2.0	Questions and Issues to be Addressed.....	5
	2.1 Questions	5
	2.2 Terminology	6
3.0	Issues regarding Value Based Airlines	7
	3.1 Emergence of LCCs/VBAs.....	7
	3.2 The manner in which FSAs compete.....	10
	3.3 Impact of LCCs/VBAs on FSA viability.....	13
	3.4 Further progress of LCCs.....	17
	3.5 Size, scope and nature of LCC markets.....	19
	3.6 Implications for passengers with complex itineraries	20
4.0	Questions regarding VBA competition in Australia and New Zealand....	22
	4.1 Are the Trans Tasman and domestic New Zealand markets no different from other markets where LCCs have succeeded?.....	22
	4.2 The likely evolution of Virgin Blue.....	22
	4.3 NZCC analysis of Factual and Counterfactual	23
	4.4 The Reasonableness of the NZCC assumptions.....	24
5.0	Summary of My Opinion.....	28
	5.1 Introduction.....	28
	5.2 The emergence, growth and impact of the LCCs	28
	5.3 The NZCC Factual and Counterfactual	29
	Appendix A: Curriculum Vitae of Dr. Michael Tretheway	30
	Appendix B: The Global Emergence of the Low Cost Carrier	32
	Appendix C: Selected LCC Aircraft Orders.....	33
	Appendix D: Market Capitalisations of Selected Airlines	34
	Appendix E: Selected LCC Actual and Break-even Load Factors.....	35

1.0 Statement of Identity, Interest and Qualifications

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, law firms, 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 1983-1996 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 successful 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 I served as a visiting fellow at the Australian Bureau of Transport and Communication Economics (1994).
- 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 operating 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)
 - 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
 - The Canadian Auto Workers;
- to a consumer group:

- The Consumers Association of Canada;

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
- Spokane International Airport;

to 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;

to aviation industry organisations:

- The International Air Transport Association
- The Canadian Airports Council;

to tourism organisations:

- Council of Tourism Associations of British Columbia
- Tourism British Columbia
- Tourism Nova Scotia
- Tourism Saskatchewan
- Puerto Rico Dept. of Tourism
- The Council of Ministers Responsible for Tourism;

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;
- 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 House of Commons Standing Committee on Finance.
- 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.
- 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, other than IVM Investments Inc.

1.3.3 I have been asked by counsel for the Applicants to provide a statement in the applications to the New Zealand Commerce Commission for an 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 and Issues to be Addressed

2.1 Questions

2.1.1 I have been asked by counsel for the Applicants to comment on the following issues and to address the following questions.

Issues regarding Value Based Airlines

2.1.2 Provide a brief overview covering:

- a) the emergence and development, and subsequent success, of low cost carriers (LCCs) / Value Based Airlines (VBAs) globally;
- b) the manner in which Full Service Airlines (FSAs) compete, e.g. in terms of network, product and costs;
- c) the impact of LCCs/VBAs on, and consequences for, the viability and pricing behaviour of FSAs;
- d) the natural or likely further progress of LCCs;
- e) the size, scope and nature of the market that can be effectively served by LCCs; and
- f) the implications of these developments for passengers with complex itineraries, who need interlining and other services not provided by LCCs.

Questions regarding VBA competition in Australia and New Zealand

2.1.3 Address the following questions:

- a) whether, and why, the Tasman and domestic New Zealand (and domestic Australia) are no different from other markets where low cost carriers have succeeded;
- b) what is the likely evolution of Virgin Blue;
- c) what is my opinion of the New Zealand Commerce Commission's (NZCC) analysis of the factual and counterfactual put forth by the Applicants;
- d) what is my opinion of the reasonableness of the following assumptions made by the NZCC in relation to the factual and counterfactual:
 - (i) the claim that VBA entry would not occur in the factual, even though it is estimated by Dr. David Gillen to be profitable; and

(ii) in the counterfactual, Tasman and domestic New Zealand markets are almost perfectly competitive, compared to a monopoly in both markets in the factual.

2.2 Terminology

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

2.2.2 However, while convention in Australia and New Zealand is 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 submissions of others.

2.2.3 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.² Providing these additional features requires the FSA to incur higher costs. 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.

² 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 the LCCs.

3.0 Issues regarding Value Based Airlines

3.1 Emergence of LCCs/VBAs

3.1.1 Issue:

Describe the emergence and development, and subsequent degree of success, of low cost carriers (LCCs) / Value Based Airlines (VBAs) globally.

3.1.2 Response:

While there have been many attempts over the past twenty five years to establish financially viable low cost carriers, 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 32 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 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, DBA, Eurowings), Canada (e.g., WestJet), South America (Brazil's GOL), Australia (Virgin Blue), and Asia (Malaysia's Air Asia).³

3.1.3 There were many previous attempts at low cost carrier business models, but these failed 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.

3.1.4 Key enablers of the emergence of viable low cost carriers have been a) deregulation of markets (especially in Europe, where prior to EU liberalisation such a carrier would have been confined to a single national market); b) in some jurisdictions, the availability of airport capacity, in part but not exclusively from the 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; and especially c) better understanding of all the elements of the LCC business model, especially proper capitalisation of the air carrier. 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."⁴

³ See Appendix B 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.

⁴ T.C. Lawton (2002), *Cleared for Takeoff: Structure and strategy in the low fare airline business*, Ashgate Publishers, p. 184.

- 3.1.5 The demonstrated success of a few new LCCs, such as Ryanair and WestJet, to replicate the Southwest airlines business model has induced capital markets, broadly defined, to finance an increasing number of LCCs.⁵
- 3.1.6 These carriers have been demonstrating sustained growth, with steadily increasing fleet sizes, number of passengers served, revenues, and in many cases profits. Growth rates in the range of 100% are common in early years; for example it is typical to commence operations with three or so aircraft, and then steadily add to capacity. In the early years growth rates as high 100% are observed. 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. For example, Canada's WestJet, now in its seventh year, is currently growing in the 30-40% range. The LCC with the longest track record, 32 year old Southwest Airlines (US), grew at an average annual growth rate of 14.7% from 1991-2001. This is significantly in excess of the 3.2% growth of the U.S. major network carriers.
- 3.1.7 Investigating a selection of ten of the major LCCs reveals that they have 633 aircraft on order and 616 on option, as of the beginning of July 2003 and as reported by Back Aviation Solutions.⁶ 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 that do have aircraft on order, a number have deferred delivery until much later in the decade. Continental Airlines, for example, recently deferred delivery of almost all of the 737s it has on order until 2008 or later. One must also consider that a substantial portion of the aircraft that network carriers have on order are intended as replacements rather than growth. Among the U.S. LCCs, much of the fleet on order is intended as growth, with only Southwest having major fleet replacement requirements.
- 3.1.8 As time passes, the high growth rates of the LCCs are resulting in an ever increasing share of traffic. In the United States, where the LCC business model has been pursued successfully by Southwest for over 30 years, it and other LCCs currently serve 24% of domestic passengers. With their traffic growing at double digit rates, their share of passengers carried will continue to increase. It is my opinion that the LCCs will approach 35-40% of the U.S. domestic airline traffic within five years, and a 50% share within ten years. This conclusion is based on the sustained higher growth of the LCCs relative to FSAs, the large number of aircraft they have on order for additional rather than replacement capacity, and their proven access to equity and other capital to finance those purchases (even in a time of severe industry

⁵ Some LCCs are financed by broad shareholdings (e.g., WestJet, Ryanair), some via private investment, such as Virgin Blue, some via an IPO, etc.

⁶ See Appendix C.

distress). For example, from the current 24% LCC share of the market traffic, and postulating an aggregate 15% growth rate for the LCCs and a 3.2% growth rate for the network air carriers,⁷ the U.S. LCCs would reach a 36% traffic share in five years and a 51% share in twenty years. If conversion of some of the network carriers' capacity into low fare formats were also contemplated (such as Delta's conversion of some of its labour and aircraft to its low fare Song brand), then the low fare (LCCs plus dedicated low fare services of FSAs) capacity share could be even higher than 36% in five years, perhaps a 40-45% combined traffic share.

3.1.9 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 *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 could achieve a 2008 traffic share in the market greater than 30%, even without considering the other LCCs in the market. In Europe, I note that Ryanair and EasyJet combined have 248 aircraft on order and 245 aircraft on option, again supporting a conclusion that their traffic share will grow.

3.1.10 Finally, 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 US network carriers combined, and did so even prior to the tragic events of September 11, 2001. In Europe, LCC Ryanair often trades places with Lufthansa 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.⁸

3.1.11 It is thus my opinion that the 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

⁷ 15% was used for LCCs based largely on Southwest's 14.7% growth rate. It has the largest share among the LCCs. The other LCCs have much higher growth rates than Southwest and are now building from increasingly larger traffic bases, indicating a much higher annual growth rate for LCCs than 14.7%. Nevertheless, recognising that Southwest's percentage growth rate may decline over the next five to ten years (but still remain considerably higher than the FSAs), and that the very high growth rates of the younger U.S. LCCs will attenuate in the coming years, and simply to be conservative, the 15% average annual growth rate was used. The FSA growth rate was the 1991-2001 average annual growth rate of U.S. majors less Southwest. Its continued use is based on the Federal Aviation Administration's view that the U.S. airline industry will resume its pre 2001 growth rates in the coming years. Data source was Table T-1, T-100 database, U.S. Bureau of Transport Statistics.

⁸ See Appendix D for the recent market capitalisations of selected airlines.

success.⁹ Unlike many of the network air carriers, they have an ability to attract significant additional equity capital. Virgin Blue in Australia is part of this industry development.

3.2 The manner in which FSAs compete

3.2.1 Issue:

The manner in which Full Service Airlines (FSAs) compete, e.g. in terms of network, product and costs.

3.2.2 Response:

The FSA offers 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 seamless access to the global network, higher in flight amenities, etc.) which a number of consumers seek and for which they are willing to pay. Value means value to the consumer in this context.

3.2.3 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.

3.2.4 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. To many passengers, especially some types of business travellers, the higher reliability this provides is of great value.

3.2.5 The FSAs also offer a range of on-ground and in-cabin services. Some travellers, such as those who travel frequently, seek amenities such as greater seat room, expedited check-in on the ground, and lounges for greater comfort or productivity while awaiting flights.

3.2.6 The FSA also typically provides a product with a high probability of having a seat available at the 'last minute' for those travellers for whom time is of the essence and who are willing to pay a fare premium. This may involve travel which is required with minimal pre-notice, or previously booked travel which must be changed to other times, dates or destinations.

⁹ 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 the US LCCs have largely confined themselves to domestic markets to date, carriers following the LCC business model have crossed national frontiers.

- 3.2.7 The high connectivity network, the high quality of service, and the high seat availability which is made available by the FSA provides value to some consumers but is 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 also 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-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 minimal number of empty seats, on average.
- 3.2.8 It should be noted that even those travellers for whom the extensive network and high service levels are not needed, are still processed through these costly systems.
- 3.2.9 One issue that has arisen in this proceeding is whether network air carriers are profit versus revenue maximisers, an issue which arises when constructing mathematical models of carrier behaviour. In some ways, FSAs engage in both kinds of behaviour, but in different time periods.
- 3.2.10 For purposes of the analysis to be undertaken in this proceeding, economic modellers should assume that FSAs are long run profit maximizers and make decisions on the most profitable level of capacity to provide in a market. Once capital is acquired and deployed into service, economists will often posit that the firm engages in maximisation of short run profits, i.e., revenues minus variable costs.
- 3.2.11 The airline production decision is a complicated one, since capacity can only be purchased in discreet units (an aircraft) and that unit of capital can only be deployed in discreet units (a flight). An airline with a 140 seat aircraft cannot add 30 more seats. The increment is either zero or a multiple of 140.
- 3.2.12 The issue is important for how airlines (both FSAs and LCCs) manage the seats they offer for sale on a day by day, even hour by hour basis. Complex algorithms have been developed to allow carriers to maximise what might be called *very short term* profits; i.e., profits in the period when the carrier has committed to operating a specific flight on a specific day. In this micro-time period (a single flight), both capital costs and other costs (e.g., flight labour) associated with the flight might be viewed as fixed, and profit maximisation may simplify to revenue maximisation. The so called seat management systems of airlines (used by both FSAs and LCCs) are also referred to as revenue management systems. These algorithms and corresponding guidelines for airline seat inventory managers are effectively revenue maximising tools. Hence, one might characterise very short term airline decisions as revenue maximisation.

3.2.13 However, airlines (both FSAs and LCCs) need to encompass not only very short term profit maximisation (which might be viewed as effectively simplifying to revenue maximisation), but also short term profit maximisation (which nets revenues against variable costs) and long term profit maximisation. Typically, short term profit maximisation is made at roughly monthly intervals, when carriers (both FSAs and LCCs) look at monthly financial results for schedule flights and decide to cancel or add schedule flights or redeploy capacity to other opportunities based on profit maximisation.

3.2.14 The issue is not whether an FSA is a revenue maximiser in some markets or circumstances and a profit maximiser in others. Almost all airlines (FSAs and LCCs) adopt revenue maximising behaviour (via the seat management systems) for the micro time period of a single flight, but revenue maximisation is no different from profit maximisation over that very short time period. As the time period lengthens, however, and certainly in the interval when the route manager evaluates flight performance, the carriers are making profit maximising decisions which are distinct from revenue maximisation, as they take account of the costs of providing service.

3.2.15 Based on the above description of profit versus revenue maximisation, it is my opinion that modelling one market condition (e.g., the counterfactual in this proceeding) as revenue maximisation and another (the factual) as profit maximisation, is incorrect. The issue is one of the time period for management decision making, the very short term versus longer periods.

3.2.16 Turning to how FSAs compete with other FSAs, it should be observed that a key dimension of the products they offer to travellers is service quality. Thus, it is frequently observed that FSAs compete with each other in this dimension: service quality is highly valued by some of their customers (in particular, the ones which are the least price elastic). Although not the only dimension of service quality, the number of flights and capacity of seats available (which affects the likelihood of a seat being available at the last minute) is of great importance, and FSAs are often observed competing in terms of schedules and capacity.¹⁰ Consistent with the Cournot model assumptions, they are observed to then charge similar prices.

3.2.17 This type of competitive behaviour, FSA to FSA, might be termed *capacity competition*. The assumption in the counterfactual model put

¹⁰ I note that this is broadly consistent with a modelling approach which is based on 'Cournot' assumptions. Cournot behaviour is such that firms compete in terms of capacity offered, with prices then being set by a market clearing mechanism. The issue as to whether airline market behaviour is better modelled by Cournot models versus other models (Bertrand pricing models) was investigated by A. Zhang and J. Brander in the early 1990s. They found that the Cournot model is more consistent with airline data. J.A. Brander and A. Zhang (1990), "Market Conduct in the Airline Industry: An empirical investigation," *Rand Journal of Economics*, pp. 567-583.

forth by the Applicants in this proceeding, that capacity competition will take place between the two FSAs, is consistent with long observed means of competition observed in this industry. If both FSAs had access to equity and other financing for expansion, one might observe both FSA carriers competing by increasing capacity. If one has severely limited access to financial capital, then it will face capacity competition from its FSA competitor, and being unable to match capacity increases, finds its capacity and market shares in decline.

3.3 Impact of LCCs/VBAs on FSA viability

3.3.1 *Issue:*

Describe the impact of low cost carriers/VBAs on, and consequences for, the viability and pricing behaviour of FSAs.

3.3.2 *Response:*

The LCCs have had two major impacts on the FSAs. First, they have introduced significantly lower prices in the market. These prices are typically less than the lowest prices regularly charged by the FSAs prior to the LCC entry. As the FSAs lower their prices, even if only for a portion of their seats, their average revenue per passenger (yield) declines.

3.3.3 Second, the LCCs have introduced different pricing schemes.

3.3.4 Both FSAs and LCCs engage in price discrimination, in the sense that travellers purchasing tickets at different points of time before a flight, or with different restrictions on the use of the ticket, pay different prices. After considerable market research, the FSAs almost uniformly adopted a price discrimination scheme which utilized *restrictions on the trip* to effect the ability to charge different travellers different prices. To “fence off” the high willingness to pay traveller 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.

3.3.5 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.

3.3.6 The LCCs also use price discrimination schemes. However, the scheme they have adopted is based largely on the date of purchase of the ticket,¹¹ and *not* on the restrictions on the trip.

¹¹ They may also charge higher prices for flights at peak periods.

3.3.7 Most importantly, the 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, Jet Blue, Virgin Blue and almost all others offer low one way fares.

3.3.8 The LCC price discrimination practice has seriously *and permanently* undermined the ability of the 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 the 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. The result is a loss of premium traffic to the LCCs.

3.3.9 This in turn, seriously undermines the revenue base of the FSAs and may ultimately threaten their existence. The FSAs may eventually respond by adopting new price discrimination schemes, similar to that of the LCCs, but they have lost their ability to extract a premium from travellers with a high willingness to pay and for which the simple service of the LCC is acceptable.

3.3.10 There are two impacts on the FSAs.

First, there is a direct diversion of some of the previous customers to the LCC.

Second, the inability to effect the previous FSA price discrimination scheme leads to introduction of a new scheme more similar to that of the LCCs. This new pricing scheme is typically applied to a broad range of routes, not merely the ones with direct competition from the LCC. In part, this is due to the threat or high likelihood of entry into their other markets. Carriers would also argue that different pricing schemes on similar routes in a region leads to market confusion and undermines a carrier's brand, hence the simplification. Both Qantas and Air Canada have recently introduced new pricing policies for their respective domestic service networks. Both carriers now offer one way fares, with different price tiers based on the date of purchase and seat availability, and on the level of service (especially the degree of flexibility of use and refundability of the ticket) the consumer desires. Qantas's new one way

pricing scheme includes a business class product, indicating the impact that the LCC pricing policy can have on the entire market.

- 3.3.11 The inability of the FSA to charge high prices to most high willingness to pay passengers reduces their profits, unless they can achieve cost reductions sufficient to offset the decline in their 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.
- 3.3.12 Even where an FSA seeks to reduce cost 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.
- 3.3.13 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, it must re-establish economies of traffic density. In 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 took place by Ansett); 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 does not appear to be happening with the successor of Swissair, which has tried 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). It would be incorrect to conclude that Virgin Blue's success was only due to the exit of Ansett and the corresponding removal of capacity from the market. WestJet in Canada has achieved success when the circumstances were a merger of two FSAs rather than the removal of the capacity of one of the FSAs.
- 3.3.14 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 productivity enhancements) will translate into only 4-6% reduction in total unit costs. The source of the cost advantages of the 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 a single aircraft type, enabling significant savings in maintenance, training, level of work force required, etc. They are successful at obtaining capital at lower costs, and operate with dramatically lower distribution costs. 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 the LCC and re-balancing its costs with the lower yields driven into the market by the LCC. Perhaps the last point is worth emphasising: when an LCC enters a market, it removes the ability of the FSA to sustain a price increase.

3.3.15 For Air New Zealand, the impact of LCC entry is likely to be dramatic. I understand that its international services collectively have essentially been break-even, at best. In those isolated cases when it has been able to achieve sufficient profitability to cover its costs of capital, it has largely been due to contributions from its domestic services. When an LCC enters the domestic market, an event I view as being virtually inevitable, its domestic yields will plummet.

3.3.16 It is interesting to note, that Air New Zealand has already been restructuring its domestic operations as if an LCC had already entered. It has simplified its domestic product and changed its price discrimination practice. Such adjustments will not necessarily forestall entry, merely somewhat better position it for the inevitable entry. Air Canada, for example, as part of its financial restructuring, has put a simple fare structure in place throughout its domestic market, which has changed its price discrimination practice. It now sells discounted one way fares in all markets. Nevertheless, this has not prevented WestJet from launching new routes. For example, it recently announced service on Ottawa-Gander, a very thin traffic route. (Gander's population of 20,000 has been supporting a traffic base of roughly 75,000 passengers per year). This underscores two points. First, that FSA response to LCC entry or expected entry, does not necessarily forestall actual entry. 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.¹²

3.3.17 As previously mentioned, the pricing policies of the LCCs is 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 in Moncton/Toronto, Fredericton/Toronto, etc.¹³ But as well, there are general market effects, in part because one destination may compete for tourists, conventions, etc., with other destinations. Qantas (and Air Canada) now offers one way fares in almost all domestic markets.

¹² It might be noted that LCCs may develop service 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 LCCs aircraft.

¹³ Hamilton is roughly one hour driving time to Toronto, Fredericton is roughly 1.75 hours driving time from Moncton.

3.3.18 It is my conclusion that LCCs have dramatic impacts on the financial viability of FSAs. Especially vulnerable are smaller FSAs with low traffic densities on their routes. LCC entry 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 note 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 a 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.

3.3.19 Air New Zealand does not have the network depth that would allow it to easily weather LCC entry. Its long haul international routes are not a source of net contribution, and thus cannot buffer the impact of LCC entry into the domestic and Trans-Tasman market.

3.4 Further progress of LCCs

3.4.1 Issue:

Describe the natural or likely further progress of LCCs.

3.4.2 Response:

The LCCs have strong economics. They have been able to maintain a substantial wedge between their average prices and their unit costs.¹⁴ The size of this positive gap between yield and unit cost is reflected in their ability to continue to earn profits, even after the traffic downturns following the 2001 recession and terrorism incidents and the more recent SARS concerns.

3.4.3 The resulting consistent profitability of the LCCs, allows them to attract additional financial capital, which in turn will allow them to expand. Their expansion will allow them to further exploit economies of traffic density in many of their markets, further lowering their unit costs.

3.4.4 The LCCs will continue to expand the markets they serve,¹⁵ and increase the level of service on existing flights.

¹⁴ See Appendix E for a trend of actual and break-even load factors of three LCCs. This is an indirect, but industry standard means of showing the wedge between costs and revenues, and illustrates the strong economics of these carriers, which makes their financial performance stable in during adverse times.

¹⁵ Lawton points out that expanding market scope is the fundamental strategy being pursued by Ryanair (it also adds frequency on existing routes, but as a secondary goal), while EasyJet's fundamental strategy is to increase traffic density on its existing network of cities (it

- 3.4.5 At the same time, in Europe and the Americas, the FSAs are poised for a period of little or no growth, and in some cases significant contraction, due to their poor financial performance and inability to earn their cost of capital. This makes inevitable a loss of traffic share to the LCCs.
- 3.4.6 A typical pattern of growth is for an LCC to begin at one 'focus city' and build a financially successful scope and frequency of flights, then to fly from that focus city to another major region.¹⁶ Once this link is in place, a second focus city is chosen and the carrier expands. WestJet, for example, began from a Calgary base and built a collection of routes and flights in Western Canada. It then launched service from its western network to Hamilton (an airport one hour from Toronto), and began to build Hamilton as a focus city in the East. Ryanair has followed a similar strategy. First, it built London Stansted and Ireland's Dublin into strong focus cities. It then crossed the English Channel and began to build a focus city at Charleroi (outside of Brussels) in the small country of Belgium, then built another at Hahn in Germany. EasyJet also started in the U.K., then built focus cities in Geneva (outside the EU) and Amsterdam. Southwest has continually expanded from its Texas base and entered new geographic markets and opened new focus cities. Examples are Chicago Midway and Baltimore (near Washington DC).
- 3.4.7 Turning to the issue of Virgin Blue, it is highly likely that it will follow its peers and begin to fly the Trans-Tasman and enter the domestic New Zealand market. It already serves 24 of the 30 largest routes in Australia and has a 27% share of domestic passengers carried. It has been able to attract financial capital and has many aircraft on order, providing the resources necessary to undertake such expansion. It is sensible that it will shortly begin to seek opportunities outside of the domestic Australia market, and both the Trans Tasman and domestic New Zealand markets are major opportunities for it. It has entered a long list of routes in Australia served only by Qantas, and it is reasonable to expect it would do the same on the Trans Tasman and in domestic New Zealand.
- 3.4.8 Some may perceive a question as to whether Virgin Blue would be unwilling to enter the Trans-Tasman and/or domestic New Zealand market if the alliance were to be authorised. It should be noted that LCCs have entered markets with multiple FSAs and where a

also adds a few new destinations each year). Ibid., p. 188. Lawton also notes that the LCC model is not monolithic (p. 188), and has variations in service and scope.

¹⁶ WestJet is believed to have originated the term focus city. It distinguishes its focus city operation from a hub operation, in that the network of the latter seeks to maximise connections with the minimum of travel, while the LCC typically does not do this, at least to the same degree. The LCCs also will 'connect the dots' in their networks, where financially viable, rather than channel travellers through major hubs, as the FSAs tended to do. EasyJet, in particular has focused on connecting the dots in its network as of higher priority than adding additional destinations. When it adds a city to its network, it is often connected to many other cities rather than to a single hub. This concept would be consistent with a LCC simultaneously entering the Trans Tasman market and connecting the dots by serving domestic New Zealand markets.

consolidation of FSAs has occurred. Southwest, Jet Blue, Ryanair, EasyJet and WestJet all entered markets with multiple FSAs. In Canada, Air Canada acquired Canadian Airlines International, resulting in a domestic market with a single FSA. Nevertheless, WestJet continued to enter new markets.

3.4.9 The proposed alliance of Qantas and Air New Zealand contains undertakings which could make entry under the factual even more likely than under the counterfactual. The alliance, for example, is proposing to make airport capacity available, and will agree to capacity limits in certain markets during a period following entry by a LCC.

3.5 Size, scope and nature of LCC markets

3.5.1 *Issue:*

Describe the size, scope and nature of the market that can be effectively served by low cost carriers.

3.5.2 *Response:*

In the U.S., which has the longest history with LCC operations, 24% of the domestic passengers are being served by LCCs. Further, the U.S. LCCs have hundreds of aircraft on order or option and strong access to financial capital to enable expansion. It is my opinion, described above in Section 3.1, that the LCCs will continue to grow and will serve at least 40% of the passengers in the market.

3.5.3 Based on my experience in conducting market research for airports and tourism organisations, it is my opinion that the scope of the operations of the LCCs will continue to expand. There are many markets which can support LCC operations but which are currently unserved by LCCs.¹⁷

3.5.4 The nature of markets served by LCCs will also evolve. While the business model originally was focused on domestic services, carriers are now crossing international borders within a continental region. The European LCCs provide services across internal borders of the European Union and serve markets, such as Switzerland which are outside the EU. WestJet has indicated that it intends to begin scheduled transborder services from Canada to the U.S. LCCs are also migrating their business model from almost exclusively short haul services (e.g., Ryanair's services from Dublin to London) to increasing numbers of routes with medium hauls. European, US and Canadian LCCs are now serving markets with flying times in the 3-5 hour range.

¹⁷ As well, as cited in a previous footnote, there are markets not currently capable of service by the type of aircraft LCCs operate, but which are seeking to improve their airport capabilities to accommodate such service.

3.5.5 In summary, it is my opinion that the LCCs will increase in size, serve an increasing scope of routes and communities, and evolve the nature of their services to embrace medium haul international services.

3.5.6 Routes across the Tasman and within domestic New Zealand are well suited to LCC service and are likely to be a target of Virgin Blue for its expansion.

3.6 Implications for passengers with complex itineraries

3.6.1 *Issue:*

Describe the implications of these developments for passengers with complex itineraries, who need interlining and other services not provided by low cost carriers.

3.6.2 *Opinion:*

These travellers seek the services provided by the FSAs, as the LCCs do not provide them, other than within their own networks.

3.6.3 However, as the LCCs put pressures on the FSAs in domestic and trans-boundary markets, the cost reduction initiatives of the FSAs will benefit passengers seeking the higher service levels of the FSAs. For example, the wage reductions and productivity concessions negotiated by US Airways, United, American, Air Canada, etc., are not wholly confined to their domestic services competing with LCCs. The labour costs of international services, first class cabin services, etc. have all been reduced, creating a benefit for travellers who use them.¹⁸ The lower costs also makes viable routes which previously were marginally uneconomic. The complex itinerary and other passengers seeking the FSA's quality dimensions will benefit greatly from this. In fact, these passengers typically are highly price inelastic, but service elastic. For them, higher service levels from a new product, such as non-stop routes where none existed previously, may raise utility more than any price reduction.

3.6.4 As well, the undermining of the previous price discrimination regime will create benefits for the complex itinerary/high service requirement passenger. In Australia, even business class travellers are now able to purchase one way fares to create itineraries which are less expensive than round trip tickets in the past. The complex itinerary passenger can avail herself/himself of very low fares on at least some segments of the itinerary.

3.6.5 It is my opinion that the importance of the network and other FSA premium services tend to be higher for long haul and international services. These markets have less concentrated point to point travel,

¹⁸ The benefit may be lower fares for these services (or greater access to discounted services), or simply the continued economic viability of these services.

and there is a greater passenger need for in-flight and on the ground services. While the FSA product will be sought after by a large portion of travellers, these markets are served by competing FSAs, and the degree of competition intensifies as the distance to be travelled increases.

3.6.6 While the FSAs may be able to reduce some cost elements, even for premium services, the costs of these services cannot be shed in full. Faced with reduced revenues from the inability to price discriminate against the high willingness to pay passenger, the carriers face a profitability challenge.

3.6.7 One market based solution to this is to reduce their unit costs by consolidation or other means to allow them to maintain or increase their economies of traffic density. The alliance between Air New Zealand and Qantas is such a market based solution. Mergers in industries with economies of scale are common and often desirable.

3.6.8 For Air New Zealand, where the long haul international network has only rarely been able to cover its capital costs, the loss of revenues and profits in the domestic New Zealand and Trans Tasman may seriously undermine its financial viability. If this is the case, then those passengers requiring complex itineraries or higher value services could be seriously affected.

4.0 Questions regarding VBA competition in Australia and New Zealand

4.1 Are the Trans Tasman and domestic New Zealand markets no different from other markets where LCCs have succeeded?

4.1.1 Question:

Whether, and why, the Tasman and domestic New Zealand (and domestic Australia) are no different from other markets where LCCs have succeeded.

4.1.2 Opinion:

The Tasman and New Zealand domestic routes are of a range and traffic levels typically served by LCCs elsewhere. There are no regulatory barriers to entry for LCCs. There appear to be substantial volumes of traffic which only need simple point to point services. These factors support the statement that they have characteristics consistent with markets served by LCCs. Neither the consumer base or the operating dimensions differ from other markets entered and served by LCCs.

4.1.3 The one difference I observe is that airport access has evolved differently in New Zealand and Australia than is the case in the U.S., Canada and Europe. Domestic terminals historically were operated and financed by the FSAs in the New Zealand and Australia markets, creating a barrier to LCC entry. For the domestic New Zealand markets, it is my understanding that the applicants are willing to provide undertakings to provide domestic terminal access of a sufficient scale to provide for LCC entry. This is in spite of the fact that Wellington and Christchurch each have domestic terminals accessible to the LCCs, and other arrangements were found in Australia where similar conditions prevailed at the time of Virgin Blue's entry.

4.1.4 Trans Tasman services are not constrained by airport access, as they use airport operated international terminals.

4.2 The likely evolution of Virgin Blue

4.2.1 Question:

What is the likely evolution of Virgin Blue?

4.2.2 Opinion:

Virgin Blue is likely to continue to grow. It clearly has been able to attract financial capital to enable its existing growth plans. It has 10

aircraft on order and another 40 on option.¹⁹ It is actively solicited by airports and their communities for service.

4.2.3 Crossing the Tasman would be consistent with its business model. The aircraft it operates are capable of this range, and there is an adequate traffic base to support its entry into this market. Similarly the domestic New Zealand market is a likely candidate, especially if it first operates Trans Tasman, allowing its aircraft fleet be connected to its core Australian operations. It is my opinion, that if it takes delivery of all the aircraft it has on order and option, it will find diminishing returns in the domestic Australian market, where it already services 24 of the 30 largest air routes, and will find that expansion across the Tasman and into New Zealand will provide good financial returns and absorb part of its future fleet.

4.2.4 It is also my opinion that expansion of Trans Tasman service by foreign network carriers such as Emirates, will not deter entry of a LCC such as Virgin into the Trans Tasman market. The foreign carriers will offer infrequent service in the market with high capacity, high in-flight and on the ground service with intercontinental aircraft. While this will constrain the incumbent FSAs, because this offers a high quality, network connected product choice for those travellers requiring high service levels, their entry is unlikely to deter an LCC such as Virgin Blue from entering the Trans Tasman. There is a portion of the LCC market which seeks frequency of service, and Virgin Blue will be able to serve this market.

4.2.5 It is also my opinion that Virgin Blue is likely to enter the Trans Tasman and domestic New Zealand markets, regardless of whether the Alliance and investment sought by the Applicants are allowed. As indicated in Section 3, LCCs have entered markets with multiple FSAs as well as markets with single FSAs. Canada's experience has shown that LCCs will enter city pair markets even after FSA consolidation.

4.3 NZCC analysis of Factual and Counterfactual

4.3.1 Question:

What is my opinion of the New Zealand Commerce Commission's (NZCC) analysis of the factual and counterfactual put forth by the Applicants.

4.3.2 Opinion:

It is my opinion that the NZCC's analysis of the factual and counterfactual is seriously flawed. As described in the Applicant's response to the NZCC draft determination, the NZCC analysis was based on serious conceptual and computation errors in the analysis undertaken by its experts. Correcting the computation errors appears to

¹⁹ Source: Back Aviation Solutions, Lundkvist fleet database, as of 5 July 2003.

have changed the net benefit computation, and hence the conclusion which should be drawn.

4.3.3 Most importantly, the NZCC's analysis is based on a flawed counterfactual (i.e., the domestic New Zealand and Trans Tasman markets are and will remain perfectly competitive.) This I address below.

4.4 The Reasonableness of the NZCC assumptions

4.4.1 Question:

What is my opinion of the reasonableness of the following assumptions made by the NZCC in relation to the factual and counterfactual: (i) the claim that VBA entry would not occur in the factual, even though it is estimated by Gillen to be profitable?

4.4.2 Opinion:

It is my opinion that the assumptions of the NZCC are incorrect for the following reasons:

- a) LCC entry is occurring throughout the world, even in small markets.
- b) LCC entry is occurring in markets where a single merged network carrier has an overwhelming domestic market share, specifically Canada.
- c) I have already discussed that the conditions for LCC entry are present in both domestic New Zealand and the Trans-Tasman.
- d) There is a well established and financially successful VBA present in Australia, Virgin Blue. This carrier has a significant number of aircraft on order or option, the aircraft type is capable of operating across the Tasman and is suited to domestic New Zealand operation, and Virgin Blue is already serving 24 of the 30 largest Australian routes.
- e) The Applicants are willing to provide an undertaking for access to domestic terminal facilities.

The only major issue is the timing of VBA entry, and that issue is resolving itself quickly.

4.4.3 Question:

What is my opinion of the reasonableness of the following assumptions made by the NZCC in relation to the factual and counterfactual: (ii) in the counterfactual, Tasman and domestic New Zealand markets are almost perfectly competitive, compared to a monopoly in both markets in the factual?

4.4.4 Opinion:

As I have already stated, it is my opinion that in the factual scenario, the domestic New Zealand and Trans Tasman markets will experience significant entry by at least one VBA, and thus cannot be characterised as a monopoly. The market would be competitive in the very important sense that the consumer has a choice of a network full service product and a VBA product. For those consumers for whom the simple VBA product is acceptable, this provides much greater choice and competition than is present in the market today, where no such choice exists.

4.4.5 Further, it is the VBA which has brought the most significant price competition to the airline industry in 25 years, that of undermining the traditional FSA price discrimination scheme. Doing so has *dramatically* lowered the price of air service, especially for travellers who previously were unwilling or unable to abide by restrictions on the low fare trip (such as the need to purchase a return fare, Saturday stayover, and minimum/maximum stay requirements). This has been of greater competitive importance than FSA to FSA competition. Benefits of the LCC pricing impact have already, to some extent, been felt in New Zealand, as the FSA (Air New Zealand) has anticipated the inevitable entry of a LCC and responded in advance.

4.4.6 It is my opinion that the counterfactual is difficult to characterise in a single clear manner, as this market will inevitably evolve and its competitive conditions will differ at different points in time.

4.4.7 Initially, the market may continue with some degree of duopoly between the two network carriers, Air New Zealand and Qantas (via its subsidiary Jetconnect and its code sharing relationship with Origin Pacific). At this stage, the market could lack service by a VBA, and would not be described as perfectly competitive. This is due to the lack of a needed product in the market, that of the VBA.

4.4.8 At a second stage, it is my opinion that even with both Air New Zealand and Qantas operating in the domestic New Zealand and Trans Tasman, a VBA will enter.²⁰ The entry of a VBA into a duopoly of network carriers has been observed several times in the recent past: in the UK, VBA Ryanair entered against a duopoly of Aer Lingus and British Airways in the "Trans Irish Sea" market; in Canada, VBA WestJet entered against the duopoly of Canadian Airlines and Air Canada; and in Australia, Virgin Blue entered against the duopoly of Ansett Australia and Qantas. The presence of a duopoly of network air carriers does not appear to be a deterrent to today's VBA business model.

²⁰ Depending on the speed of entry of Virgin Blue, the market in the counterfactual scenario may proceed directly to the second phase.

- 4.4.9 At a third stage, the market fails to support one of the network duopolists and one exits willingly, via bankruptcy, or through merger.²¹ This results in a market characterised by a single major network carrier, and a financially successful VBA. In Canada, Canadian Airlines effectively became bankrupt and was merged into the surviving network carrier, Air Canada. In Australia, Ansett became bankrupt and was liquidated.
- 4.4.10 While I have offered examples of the exit of an FSA by liquidation and merger, it is also possible to exit via a co-operative alliance. In the UK, British Airways voluntarily exited the “Trans Irish Sea” market following the entry and expansion of Ryanair on the Dublin-London route. BA retained market access via a code sharing arrangement with the surviving FSA duopolist, Aer Lingus. Three different exit strategies are demonstrated by these examples, but they all had the same stage three outcome: the exit of one of the two duopolist FSAs.
- 4.4.11 My opinion is thus that both the factual and counterfactual will eventually result in the same outcome, a major network carrier competing with a VBA in both the domestic New Zealand and the Trans Tasman market. The issue is how the transition takes place in the counterfactual (slowly and painfully) versus the factual (more quickly, with retention and enhancement of dual marketing brands).
- 4.4.12 The only other possibility I envision is continuation of Air New Zealand via continuing subsidy by the public treasury. It is this scenario that could deter entry by a LCC. As pointed out by Drs. Morrison and Winston in Chapter 8 of the Applicant’s response to the draft determination (p. 5 of Appendix II of the chapter), continued subsidisation of a carrier which is not financially viable may discourage efficient capacity from entering a market. It seems appropriate to rule this eventuality out of consideration. I refer the Commission to the confidential letter from the Government of New Zealand contained in Chapter 6 of the Applicants’ response to the Draft Determination, and to the recent cross submission of Virgin Blue, indicating its intent to enter the Trans Tasman and domestic New Zealand markets.
- 4.4.13 It is also my opinion that a unique feature of the Trans Tasman market is the increasing presence of other network air carriers via 5th freedom operations. Globally, fifth freedom services are less common than they once were (when aircraft ranges were much more limited), but given the distances to Australia/New Zealand and the size of markets, the economics of such services are favourable. The presence of fifth

²¹ It is not an inevitability that one of the network duopolists exits the market following LCC entry. In a very large markets, such the U.S., competing FSAs may survive. However, the size of the Trans Tasman and the domestic New Zealand markets is not conducive to long term FSA rivalry in the presence of a strong LCC. In the larger Australian market, the smaller FSA exited the market through liquidation. In Canada, the two FSAs merged. Even in the U.S., several FSAs have entered bankruptcy protection and all the other major FSAs are seeking major voluntary restructuring.

freedom services will act as a pricing constraint on the FSA carriers in the Trans Tasman, with or without the requested alliance.

5.0 Summary of My Opinion

5.1 Introduction

5.1.1 This section reviews the conclusions I have drawn and offers my opinion.

5.2 The emergence, growth and impact of the LCCs

5.2.1 In roughly the last ten years, LCCs have successfully learned to replicate the business model of Southwest Airlines. Coupled with deregulation and other removal of entry barriers (e.g., airport capacity), LCC carriers are emerging throughout the globe. Their expansion is inevitable, given their strong financial position and ability to finance significant expansion.

5.2.2 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 of one way tickets has resulted in access to significantly lower fares even for business travellers. This has been the largest impact on price competition in airline markets in the past 30 years, much larger than any competition between FSAs.

5.2.3 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, and outside of the U.S., air carrier consolidation will need to involve some form of cross border transaction.

5.2.4 LCC entry into Trans Tasman and domestic New Zealand is virtually inevitable, in my opinion, regardless of whether the Applicants' request to form an alliance is granted. The Trans Tasman and domestic New Zealand have all the characteristics of range and market size to support LCC service. The Australian LCC, Virgin Blue, has many aircraft on order and option, and already services 24 of the 30 largest domestic Australia routes. Its expansion across the Tasman and into domestic New Zealand is both logical and virtually inevitable.

5.2.5 The LCCs have induced benefits for travellers on the FSAs. The impracticality in the presence of LCCs of the traditional FSA pricing practices (restrictions on trips such as required purchase of return fare and Saturday stayover having been required in the past by the FSAs to obtain a discounted fare) has resulted in major reductions in fares paid by travellers, including business travellers, even those with multi-stop itineraries.

5.3 The NZCC Factual and Counterfactual

- 5.3.1 It is my opinion that the factual and counterfactual assumptions contained in the NZCC Draft Determination are seriously flawed.
- 5.3.2 The assumption that there would be a monopoly with the requested alliance (the factual) is unrealistic. Entry by a LCC is virtually inevitable, with or without the alliance. As well, the requested alliance provides conditions which facilitate entry by a LCC.
- 5.3.3 The assumption that without the alliance, markets would be perfectly competitive is also unrealistic. Without the alliance, the impact of LCC entry and expansion undermines the ability of markets to support multiple FSAs in domestic markets. For New Zealand in particular, the almost virtual inability of Air New Zealand to earn its cost of capital on long haul international services makes its continued financial viability doubtful as an LCC enters the domestic market. The inevitable domestic revenue erosion means that Air New Zealand will need to dramatically reduce its cost and/or exit the industry. It is my opinion, that if the requested alliance were denied, an LCC would enter the market and eventually Air New Zealand will exit the industry.
- 5.3.4 The factual and counterfactual eventually have the same outcome. The only issue is the path to get there: slow and painful without the alliance, or quickly while maintaining and enhancing both the Air New Zealand and Qantas marketing brands.

Appendix A: Curriculum Vitae of Dr. Michael Tretheway

CURRICULUM VITAE

MICHAEL WILLIAM TRETHERWAY

Last revised: 12 November 2002

BIOGRAPHICAL DATA

Date of Birth: May 22, 1952

Marital status: Married

Children: Two adult children

Home Address:

12471 Alliance Drive

Richmond, B.C. V7E 6J2

Canada

Phone: 1-604-275-2418

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 Titles

"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

Honourary 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
- 1978-81: Research Associate, Laurits R. Christensen Associates, Inc.,
- 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

1. *Canadian Airline Deregulation and Privatization: Assessing Effects and Prospects*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1985. [with T.H. Oum and D.W. Gillen].
2. *Airline Cost and Performance: Implications for Public and Industry Policies*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1986, [with T.H. Oum and D.W. Gillen].
3. *Deregulation and Airline Employment: Myth Versus Fact*. Centre for Transportation Studies, University of British Columbia, Vancouver, 1986, [with R.J. Andriulaites, D.L. Frank and T.H. Oum].
4. *The Growth and Performance of the Canadian Transcontinental Railways: 1956-1981*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1987, [with K.D. Freeman, T.H. Oum and W.G. Waters II].
5. *Identifying and Measuring the Impact of Government Ownership and Regulation on Airline Performance*, report submitted to Economic Council of Canada and Consumer and Corporate Affairs Canada, March, 1985, revised October, 1986, published as a *refereed* technical report by the Economic Council of Canada 1987, [with T.H. Oum and D.W. Gillen].
6. *Airline Deregulation*, a special issue of the *Logistics and Transportation Review*, editor and author of introduction, Volume 22(4), December, 1986.
7. *Productivity in the Canadian Lumber Industry: An Inter-regional Comparison*, Forestry Canada, Information Report 0-X-411, Great Lakes Forestry Centre, 1990, [with A. Ghebremichael and D.G. Roberts].

8. *Airline Economics: Foundations for Strategy and Policy*, 1992, Centre for Transportation Studies, Vancouver.

B. Chapters in Books

1. "U.S. Trunk Air Carriers, 1972-1977: A Multilateral Comparison of Total Factor Productivity," in Thomas G. Cowing and Rodney E. Stevenson, editors, *Productivity Measurement in Regulated Industries*, Academic Press, 1981, pp. 47-76, [with D.W. Caves and L.R. Christensen].
2. "Economic Performance of U.S. and Canadian Railroads: The Significance of Ownership and the Regulatory Environment," in W.T. Stanbury and F. Thompson, editors, *Managing Public Enterprises*, Praeger, New York, 1982, pp. 123-151, [with D.W. Caves, L.R. Christensen and J.A. Swanson].
3. "An Assessment of the Efficiency Effects of U.S. Airline Deregulation via an International Comparison," in E.E. Bailey (ed.), *Public Regulation: New Perspectives on Institutions and Policies*, MIT Press, Cambridge, 1987, pp. 285-320, [with D.W. Caves, L.R. Christensen, and R.J. Windle].
4. "Network Effects and the Measurement of Returns to Scale and Density for U.S. Railroads," in Andrew F. Daughety, (ed.), *Analytical Studies in Transport Economics*, Cambridge University Press, 1985, pp. 97-120, [with D.W. Caves, L.R. Christensen and R.J. Windle].
5. "Air Canada," in Mark C. Baetz and Paul W. Beamish (eds.) *Strategic Management: Canadian Cases*, 1986, pp. 127-144, [with D.W. Gillen and T.H. Oum].
6. "Airline Deregulation in Canada," in K. Button (ed.), *Airline Deregulation: International Experiences*, David Fulton Publishers, London, 1991, pp. 124-179, [with T.H. Oum and W.T. Stanbury].
7. "Airline Deregulation in Canada and It's Economic Effects," in Hayashi (ed.), *The New Dimensions for Public Utility*, (in Japanese), 1990. [with T.H. Oum and W.T. Stanbury]
8. "Canada and the Changing Regime in International Air Transport," in M. Zacher (ed.) *Canadian Foreign Policy and International Economic Regimes*, UBC Press, 1992, pp. 189-214, [with M.E. Dresner].
9. "Costing the Movement of Hazardous Materials by Rail," in L. Moses (ed) *Transportation of Hazardous Materials: Issues in Law, Social Science and Engineering*, Kluwer Academic Publishers, 1991, pp.6-39 to 6-58. [with W.G. Waters II].
10. "Island Programs: The UBC Experience with a Summer Program in France," in A.M. Rugman and W.T. Stanbury (eds), *Global Perspective: Internationalizing Management Education*, University of British Columbia Centre for International Business Studies,

1992, pp. 345-352.

11. "Canada-U.S. Open Skies" in C. Findlay (ed.), *Asia Pacific Air Transport*, 1997, pp.154-169.
12. "Impediments to Liberalization in Asia Pacific International Aviation," in C. Findlay (ed.), *Asia Pacific Air Transport*, pp. 65-73.
13. "Airport Marketing: An Oxymoron?" in G. Butler (eds.), *Handbook of Airline Marketing*, McGraw Hill, 1998.
14. "Costing the Movement of Hazardous Materials by Rail," (with M.W. Tretheway) in L. Moses and D. Lindstrom, eds., *Transportation of Hazardous Materials: Issues in Law, Social Science and Engineering* (Kluwer Academic Press) 1993, pp.277-294.

C. Papers in Refereed Journals or Conference Proceedings

1. "Flexible Cost Functions for Multiproduct Firms," *Review of Economics and Statistics*, August, 1980, pp. 477-481, [with D.W. Caves and L.R. Christensen].
2. "Productivity Performance of U.S. Trunk and Local Service Airlines in the Era of Deregulation," *Economic Inquiry*, July, 1983, Vol. 21, No. 3, pp. 312-324, [with D.W. Caves and L.R. Christensen].
3. "Economies of Density Versus Economies of Scale: Why Trunk and Local Service Airline Costs Differ," *Rand Journal of Economics*, Winter, 1984, pp. 471-489, [with D.W. Caves and L.R. Christensen].
4. "Reforming Canadian Airline Regulation," *Logistics and Transportation Review*, Vol. 20 No. 3, September, 1984, pp. 261-284, [with T.H. Oum].
5. "The Total Factor Productivity of the Canadian Class I Railways: 1956-1981," *Logistics and Transportation Review*, Vol. 21, No. 3, September 1985, pp. 249-276, [with K.D. Freeman, T.H. Oum and W.G. Waters II].
6. "The Effect of New Entry on Productivity Growth in the U.S. Airline Industry: 1947-1981," *Logistics and Transportation Review*, Vol. 21, No. 4, December 1985, pp. 299-335, [with D.W. Caves, L.R. Christensen, and R.J. Windle].
7. "Airline Seat Management," *Logistics and Transportation Review*, Vol. 22(2), June 1988, pp.115-130. Paper also appeared in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1986, pp. 232-245. This paper won the 1986 award for best paper on a management topic. Because of the award, the paper also appeared in the Sept. 1986 *Proceedings* of the Transportation Research Forum [with D.J.H. Kraft and T.H. Oum].
8. "Entry Barriers and Anti-competitive Behaviour in a Deregulated Airline Market: The

- Case of Canada," in *International Journal of Transport Economics*, Vol. 15(1), February 1988; also published in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1986, pp. 483-493. This paper won the 1986 award for best paper on a policy topic. Because of the award, the paper also appeared in the Sept. 1986 *Proceedings* of the Transportation Research Forum, [with D.W. Gillen and T.H. Oum].
9. "Airline Deregulation: A Bibliography," *Logistics and Transportation Review*, Volume 22(4), December, 1986, pp. 449-489, [with W.T. Stanbury].
 10. "Policy Choices for Canada in International Air Transport," in *International Business*, Ann Gregory (ed)., refereed proceedings of the Administrative Sciences Association of Canada, Vol. 8, No. 8, June, 1987, pp. 83-94 [with Martin Dresner].
 11. "Duopoly in Canada's Airline Industry: Consequences and Policy Issues," *Canadian Public Policy*, Vol. 14(1), March 1988, pp. 15-31 [with D.W. Gillen and W.T. Stanbury].
 12. "Ramsey Pricing in the Presence of Externality Costs," *Journal of Transport Economics and Policy*, September, 1988, pp. 307-317 [with T.H. Oum].
 13. "The Changing Role of IATA: Prospects for the Future," *Annals of Air and Space Law*, Vol. 13, 1988, pp. 3-23 [with M. Dresner].
 14. "Airport Pricing Policies: An Application to Canadian Airports," *Journal of the Transportation Research Forum*, Vol. XXIX, No. 1, 1988. This paper won the A.T. Kearney Inc. Best Paper award at the Transportation Research Forum, Toronto, 1988, [with D.W. Gillen and T.H. Oum].
 15. "The Canada - U.S. Air Transport Bilateral: Will It Be Freed?" *Transportation Practitioners Journal*, Vol. 56(4), Summer 1989, pp. 393-405, also in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1988, [with M.E. Dresner and C. Hadrovic]. Excerpts also appear in *Air Transport Management*, March/April, 1988, Vol. 1(1).
 16. "Airline Cost Structure and Policy Implications: A Multi-product Approach for Canadian Airlines," *Journal of Transport Economics and Policy*, January 1990, pp.9-34, [with D.W. Gillen and T.H. Oum].
 17. "Hedonic versus General Specifications of the Translog Cost Function," *Logistics and Transportation Review*, Vol. 25(1), March 1989, pp. 3-21 [with T.H. Oum].
 18. "Privatization of Air Canada: Why is it Necessary in a Deregulated Environment," *Canadian Public Policy*, Vol. 15(3), September 1989, pp. 285-299 [with D.W. Gillen and T.H. Oum].
 19. "Frequent Flyer Programs: Marketing Bonanza or Anti-Competitive Tool?" *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Service, May 1989, pp. 433-446. This paper won honourable mention for

- best paper. This paper was also published in *Journal of the Transportation Research Forum*, Vol. XXX(1), 1989, pp. 195-201.
20. "Airline Hub and Spoke Systems," *Journal of the Transportation Research Forum*, Vol. XXX (2), 1990, pp. 380-393 [with T.H. Oum].
 21. "Productivity Performance of the Canadian Pulp and Paper Industry," *Canadian Journal of Forest Research*, Vol. 20, No. 6, pp. 825-836, June 1990 [with A. Ghebremichael, D. Frank and T.H. Oum].
 22. "Allocation of Airline Seats Between Stochastically Dependent Demands," *Transportation Science*, August, 1990, Vol. 24(3), pp. 183-192 [with S.L. Brumelle, J.I. McGill, T.H. Oum, and K. Sawaki].
 23. "Globalization of the Airline Industry and Implications for Canada," *The Logistics and Transportation Review*, Vol. 26(4), December 1990, pp. 357-367; paper also appeared in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, June 1990, pp. 150-159; paper also is forthcoming in *The Advocate*, Vancouver Bar Association.
 24. "A Note on Capacity Utilization and the Measurement of Scale Economies," *Journal of Business and Economic Statistics*, January 1991, Vol. 9(1), pp. 119-123 [with T.H. Oum and Y. Zhang].
 25. "A Comparison of the Productivity Performance of the U.S. and Canadian Pulp and Paper Industries," *Journal of Business Administration*, Vol. 20(1), 1992, pp. 212-235, [with T.H. Oum], also in *Emerging Issues in Forest Policy*, P.N. Nemetz (ed.) 1992, UBC Press, Vancouver, pp. 212-235.
 26. "Airline Deregulation in Canada and its Economic Effects," *Transportation Journal*, Vol. 30(4), Summer 1991, pp.4-22 [with T.H. Oum and W.T. Stanbury].
 27. "Productivity Adjustment to Price Levels in Regulated Rail Markets: Recent Developments in Canada and the United States," *Journal of the Transportation Research Forum*, 1991 Vol. 32 (1), pp. 172-181.
 28. "Modelling and Testing the Effect of Market Structure on Price: The Case of International Air Transport," *Journal of Transport Economics and Policy* [with M.E. Dresner].
 29. "ICAO and the Economic Regulation of International Air Transport," *Annals of Air and Space Law*, Vol. 17, Part II, 1992, pp. 195-211 [with M.E. Dresner].
 30. "Concepts, Methods and Purposes of Productivity Measurement in Transportation," *Transportation Research-A*, 1992, Vol.26A No.6, pp.493-505 [with T.H. Oum and W.G. Waters II].
 31. "Aggregation and Accuracy in Measuring Total Factor Productivity: Evidence from

- Rail Productivity Studies," (with W.G. Watters II) *Journal of Transportation Research Forum*, Vol. 25:2 (1995)
32. "The Total Factor Productivity of Canadian Railways, 1956-1991," (with W.G. Waters II and A.K.Fok) *Journal of Transport Economics and Policy* (Jan., 1997) pp.93-113.
 33. "Reregulation of the Airline Industry -- Could Price Cap Regulation Make a Contribution?" (with W.G. Waters II), *J. of Air Transport Management* Vol 4 (1998) 47-53.
 34. "Measuring Productivity and Price Performance: Concepts and Applications to Canadian Railways", (with W.G. Waters II) *Journal of Transport Economics & Policy* (forthcoming 1999)
 35. "Labour payouts, productivity measurement and the price cap approach to regulation" (with W.G. Waters II) *J. of Transportation Research Forum* (forthcoming).
 36. "A Sensitivity Analysis of Total Factor Productivity Measurement: Evidence from Rail productivity Studies," (with W.G. Waters II), *World Transport Research (refereed Proceedings of the World Conference on Transport Research)* Vol. 4, Transport Management, (New York: Elsevier), 1995.
 37. "Labour Payouts, Productivity Measurement and Price Cap Regulation," (with W.G. Waters II), *Proceedings*, (U.S. Transportation Research Forum, San Antonio, TX (October 1996) Vol.2, 688-698.

Also published in *Journal of the Transportation Research Forum* (2000), Vol. 39 (1), pp. 131-144.

D. Reports

1. "The Structure of the Canadian Airline System and the Expected Impact of the Movement Toward Deregulation," Three volume report submitted to Treasury Board of Canada, March 1985, [with T.H. Oum and D.W. Gillen].¹
2. "Predatory Pricing in a Deregulated Canadian Airline Industry," confidential report submitted to Bureau of Competition Policy, Consumer and Corporate Affairs Canada, February, 1986, [with D.W. Gillen and T.H. Oum].
3. "Pricing Principles for Canadian Airports," a report prepared for Airports Task Force, Transport Canada, July, 1986, [with A. Manoucheri, D.W. Gillen and T.H. Oum].
4. "Pricing Policies for Canadian Airports with an Emphasis on Airfield Operations," a report prepared for Airports Task Force, Transport Canada, September, 1986, [with

¹ Revised version published as a book by Centre for Transportation Studies, UBC.

D.W. Gillen and T.H. Oum].

5. "Grain Costing Indices," confidential report prepared for Trade and Transportation Group for submission in regulatory hearings, Ottawa, November 1986.
6. "The Emergence of Airline Families: Issues of Control," report prepared for the Canadian Airline Pilots Association, February, 1987.
7. "The Impact of Bill C-18 on Employment in the Canadian Railway Industry," published as a Technical Report, Transport Canada, February, 1987, [with F.W. Trotter].
8. "Bill C-18 Rail Labour Impact Study," submitted to Transport Canada, March 1987 [with the Trade and Transportation Group and the Productivity Study Group, UBC].
9. "Development of Vancouver International Airport: Environment and Factors Affecting Success," report prepared for Asia Pacific Committee, and B.C. Department of Regional and Industrial Expansion, September, 1987.
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.
11. "A Study of Peak Period Pricing with an Application to Toronto International Airport," report submitted to Airports Authority Group and Cost Recovery and Evaluation, Transport Canada, May 1988, [with D.W. Gillen and T.H. Oum].
12. "Alberta's Air Transportation System: Strategic Forces and Structural Alternatives," report submitted to Alberta Economic Development, April 1988, [with D.G. Dale, D.L. Frank, S.J. Ling and T.H. Oum].
13. "Review of Research Report on URCS Regression Equations," in U.S. Interstate Commerce Commission, *Uniform Railroad Costing System: Research Report*, July 1988, Washington, DC [with W.G. Waters II].
14. "Critical Review of Economic Analysis of Capacity Enhancement Strategies for Vancouver International Airport," review submitted to Vancouver International Airport's Airside Capacity Enhancement Management Team, November 1989.
15. "Monopoly versus Duopoly in Canada's Airline Industry: Policy Alternatives and Consequences," prepared for the Economic Research Branch, Transport Canada, October 1991 [with T.H. Oum].
16. "Comments on Transport Canada's Proposed New Cost Recovery Policy: Phase II Discussion Paper," March 1991 [with T.D. Heaver, G.C. Chow, T.H. Oum and W.G. Waters II].
17. "Report of the Ministerial Task Force on International Airline Policy," July 1992. [I was Director of Research for the Task Force].

18. "The Economic Impact of a Transpacific Cargo Service" November 1994, for the Vancouver International Airport. [with S. Lui].
19. "The Economic Impact of a South Airport Operator: The Case of Harbour Air," November 1994, for the Vancouver International Airport. [with K. Kotlarchuk and L. Erbe].
20. "The Potential for Separating Rail track infrastructure from rail transportation," November 1994, for the Bureau of Competition Policy.
21. "The Economic Impact of the Vancouver International Airport: Summary Report" February 1995.
22. "The Employment and Economic Impact of the Vancouver International Airport," February 1995. [with L. Erbe and K. Tse]
23. "A Study of Economic Multipliers and their Application to the Economic Impact of the Vancouver International Airport," February 1995. [with K. Tse]
24. "The Employment Impact of a South Airport Floatplane operator: Harbour Air," February 1995. [With L. Erbe and K. Kotlarchuk.]
25. "The Employment Impact of Cathay Pacific's three times weekly cargo service," February 1995, [with S. Lui]
26. "Measuring Productivity Performance and Financial Returns for Canadian National and CP Rail, 1956-1991" UBC Centre for Transportation Studies (March, 1994) 302pp.
27. "The Feasibility of Grain-Specific Productivity Measurement for Regulating Railway Grain Rates in Canada," (with W.G. Waters II), for the Canadian Transportation Agency, Ottawa/Hull, 18pp. 14 March 97.

E. Testimony Provided

1. "Comments on Freedom to Move," Minutes of Proceedings and Evidence of the House of Commons Standing Committee on Transport, Issue #37, 19 November 1985, [with T.H. Oum].
2. "Analysis of the Changes in Airline Regulation Proposed in Bill C-18," Faculty of Commerce and Business Administration Working Paper, University of British Columbia, Vancouver, presented to House of Commons Standing Committee on Transport on behalf of the Consumers' Association of Canada, March, 1987, testimony appears in *Minutes of Proceedings and Evidence of the House of Commons Standing Committee on Transport*, Issue #17, 12 March 1987, [with W.T. Stanbury].
3. "Amendments Recommended to Bills C-18 and C-19," *Minutes of Proceedings and*

Evidence of the House of Commons Standing Committee on Transport, Issue #19, 16 March 1987, [with G.C. Chow, T.D. Heaver, T.H. Oum and W.G. Waters, II].

4. "Monitoring the Effects of the National Transportation Act, 1987, and Associated Legislation," a report to Transport Canada, 29 May 1987, [with G.C. Chow, T.D. Heaver, T.H. Oum and W.G. Waters II].
5. "Railroad Productivity Measurement," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 290 (Sub. 4), 16 December 1988, [with W.E. Diewert and W.G. Waters II]. Reply verified statement submitted 17 January 1989.
6. "Analysis of the Effect of the Gemini Computer Reservation System Merger on Competition in the Canadian Airline Industry," affidavit prepared for Consumer and Corporate Affairs Canada for submission to Canadian Competition Tribunal, 1 March 1989.
7. "Comments" on the Uniform Railroad Costing System," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 431 (Sub 1), 20 March 1989, Washington, DC [with W.G. Waters II].
8. "Comments," submitted to Canadian National Transportation Agency hearings on VIA Rail Pricing Policies," 30 March 1989 [with T.D. Heaver, T.H. Oum and W.G. Waters II].
9. "Physical Versus Deflated Expenditure Approaches Toward Rail Productivity Measurement," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 290 (Sub. 7), 26 May 1989 [with W.G. Waters II]. Reply Verified Statement submitted 26 June 1989.
10. "Verified Statement," submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 290 (Sub. 4), 14 August 1989 [with W.G. Waters II]. Reply verified statement submitted 29 August 1989.
11. "Strategic Options for Wardair," testimony prepared for the Air Crew Association of Canada (Wardair Pilots) for submission to labour arbitration hearing, November 1989. Reply testimony submitted January 1990.
12. "Statement to Commission of Inquiry on Canadian University Education," 6 November 1990.
13. "Submission to the Royal Commission on National Passenger Transportation on behalf of the Director of Investigation and Research: Competition Act," 15 November 1990. Submission jointly drafted with staff of the Bureau of Competition Policy and Professor George Wilson (Indiana).

14. "Submission of the Centre for Transportation Studies, UBC, to the Royal Commission on Passenger Transportation," 6 December 1990, Vancouver [with T.D. Heaver, G.C. Chow, T.H. Oum and W.G. Waters II].
15. "Verified Statement" submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 290 (Sub. No. 7), 5 April 1991. Reply verified statement submitted 6 May 1991.
16. "Verified Statement" submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 431 (Sub.No.2), 14 August 1991.
17. "Statement in Support of the Director of Investigation and Research Gemini 106 Application," submitted to the Competition Tribunal, 30 December 1992, oral statement 9 February 1993.
18. "Statement in support of the Director of Investigation and Research," submitted to National Transportation Agency, oral testimony given 14 April 1993.
19. "Statement of Michael W. Tretheway," for Qantas Airways and British Airways before the Australian Trade Practices Commission, September 1994. Additional statements were filed in Oct. 1994, December 1994, January 1995.
20. "Report on the Growth and Prospects of Regional Carriers," for the Air B.C. Master Executive Council before a labour arbitrator, November 1994.
21. "Preliminary Comments on the proposed acquisition of CAST by CP Ltd. subsidiary CANMAR," confidential report prepared for counsel for Bureau of Competition Policy, 23 March 1995.
22. "Statement of Dr. Michael W. Tretheway," prepared for T1T2 Ltd., to the Federal Court of Canada, December 1995.
23. "Statement of Dr. Michael W. Tretheway," prepared on behalf of Qantas Airways Ltd., to the New Zealand Commerce Commission, 1996.
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

1. "An International Comparison of Airlines," *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1984, pp. 653-676.
2. "Measuring and Identifying the Causes of the Productivity Performance of the Canadian Class I Railroads: 1956-1981," *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1985, pp. 743-

765, [with K.D. Freeman, T.H. Oum and W.G. Waters II].

3. "Productivity Adjustment to Price Levels in Regulated Rail Markets: Recent Developments in Canada and the United States," *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, June, 1990, pp. 339-350 [with W.G. Waters II].
4. "Productivity Trends in Canadian and U.S. Railroads," forthcoming *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, June, 1991, pp. 436-450 [with W.G. Waters II].
5. "Costing the Movement of Hazardous Materials by Rail," *Hazmat Transport '91*, a National Conference on Management and Policy Issues in the Transportation of Hazardous Materials and Wastes, Northwestern University, Evanston, IL, June 17-19, 1991 [with W.G. Waters II].
6. "U.S. Railroad Productivity After Staggers," *Proceedings*, Transportation Research Forum, New Orleans, October 1991, pp. 521-531, published by TRF, Arlington, VA [with W.G. Waters II].
7. "Re-regulation of the Airline Industry: Would Price Cap Regulation Work?" *Proceedings*, Canadian Transportation Research Forum, May 1994, University of Saskatchewan Printing Services. [with W.G. Waters II]
8. "Long Term Capital Input Trends and Financial Performance Measures for CN and CP," in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, June, 1994. [with W.G. Waters II].

G. Papers Under Review

1. "The economics and politics of taxation and subsidies for ports and airports," September 2002 [with T.D. Heaver]

H. Unpublished Working Papers

1. "A Reexamination of Scale Economies for U.S. Trunk Airlines," SSRI Discussion Paper #8026, Dept. of Economics, University of Wisconsin-Madison, December, 1980, [with D.W. Caves and L.R. Christensen].
2. "Productivity Effects of Mergers in the U.S. Rail Industry: Economies of Density versus Economies of Firm Size," presented at Econometric Society Meetings, San Francisco, December 1983, [with D.W. Caves, L.R. Christensen and R.J. Windle].
3. "Cost Structure and Economic Performance of the Canadian Class I Railroads," University of British Columbia, Faculty of Commerce Working Paper 1087, February, 1985, [with K.D. Freeman, T.H. Oum and W.G. Waters II].

4. "Productivity in the U.S. Trucking Industry: The Early Deregulation Experience," Working Paper, June, 1987, [with G. Chow].
5. "Total and Variable Factor Productivities: Relationships to Cost Function Estimation," Working Paper, May, 1987.
6. "Cost Function Estimation, Economists Versus the Practitioners: An Exploratory Analysis," Working Paper, July, 1987, [with T.H. Oum and W.G. Waters II].
7. "Measurement of the Social Marginal Costs at a Congested Airport: An Application to Toronto International Airport," Working Paper, Faculty of Commerce and Business Administration, University of British Columbia, December, 1987 [with D.W. Gillen and T.H. Oum].
8. "A Comparison of the Productivity Performance of the Canadian, U.S. and Swedish Pulp and Paper Industries," Working Paper, Faculty of Commerce and Business Administration, University of British Columbia, March, 1989 [with T.H. Oum].
9. "Pricing to Reflect Airport Runway Congestion: A Simulation-Based Methodology," Working Paper, Faculty of Commerce and Business Administration, University of British Columbia, May, 1989 [with T.H. Oum and D. Uyeno].
10. "Productivity Measurement of the Pulp and Paper Industry, with an Adjustment for Capacity Utilization: A Comparison of Canada, Sweden, and the U.S." Working Paper, March 1990, [with T.H. Oum and Y. Zhang].
11. "Price Discrimination and Economics of Scope: Are Current Airline Practices Socially Optimal?" Working Paper 90-TRA-008, Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, May 1990, [with I. Savage].
12. "The Characteristics of Modern Post-Deregulation Air Transport," Working Paper, Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, February 1991.
13. "Productivity Measurement, Decomposition, and Efficiency Comparison of the Pulp and Paper Industry: Canada, the U.S. and Sweden, March 1991 [with T.H. Oum and Y. Zhang].
14. "European Air Transport in the 1990s: Deregulating the Internal Market and Changing Relationships with the Rest of the World," Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, June 1991.
15. "The Cost Competitiveness of Canadian Air Carriers," Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, June 1991.
16. "Measurement and Comparison of the Productive Efficiency of the Pulp and Paper Industry: Canada, the U.S. and Sweden," Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, December, 1992 [with T.H.

Oum and Y. Zhang].

17. "Productivity Measurement and Its Application to the Rail Industry," Working Paper 90-TRA-011, Faculty of Commerce and Business Administration, University of British Columbia, Vancouver, September 1990, [with W.G. Waters II].
18. "Global Consolidation Forces in the World Airline Industry" February 1992. Paper is in a revise and resubmit status.
18. "Measuring Output and Price Productivity: Concept and Application to Canadian Railways," August 1993. [with W.G. Waters II].
19. "The Total Factor Productivity of the Canadian Railways," April 1994. [with W.G. Waters] Paper is in a revise and resubmit status.
20. "Aggregation and Accuracy in Measuring Total Factor Productivity: Evidence from Rail Productivity Studies," April 1995.

I. Other Unpublished Papers

1. "Measuring Productivity Sharing in Regulated Industries," Working Paper, Faculty of Commerce and Business Administration, The University of British Columbia, Vancouver, June 1991.
2. "Productivity in the North American Rail Industry," March 1992 [with W.G. Waters II].
3. "Labour Payouts, Productivity Measurement and Price Cap Regulation," July 1994. [with W.G. Waters II].
4. "Government Policy Toward the Canadian Airline Industry: 1980-1993," January 1994. [with W.T. Stanbury].
5. "The Concept of a Critical Mass Airport," working paper to be published in Strategic Plan of the Vancouver International Airport. June 1994.
6. "A Sensitivity Analysis of Total Factor Productivity Measurement: Evidence from Rail Productivity Studies," April 1995 for presentation at World Conference on Transportation Research. [with W.G. Waters]
7. "Separating Rail Infrastructure from Rail Transportation Services: Economic Principles and International Experiences," May 1995.
8. "The economics and politics of taxation and subsidies for ports and airports," June 2002. [with T.D. Heaver]

J. Other Publications

1. "Airline Productivity Under Deregulation," *Regulation*, Nov./Dec. 1982, pp. 25-28, [with D.W. Caves and L.R. Christensen].
2. "The Canada-U.S. Air Transport Bilateral: Will It Be Freed?" *Air Transport Management*, Vol. 1(1) March (April) 1988, pp.9-12 [with M.E. Dresner and C. Hadrovic].
3. "Survival Under Freer Skies," *Air Transport Management*, Vol. 1(2), May/June, 1988, pp. 10-12 [with D.W. Gillen and T.H. Oum].
4. "Selling Air Canada: A No-Lose Situation," *Globe and Mail*, 16 May 1988, p. A7 [with W.T. Stanbury].
5. "Hidden Agendas are Distorting the Safety Issue," *Air Transport Management*, Vol. 1(3), September/October 1988, p.11.
6. "Airport Pricing and Capacity Expansion: Economic Evaluation of Alternatives," *Transport Review*, published by Transport Canada, forthcoming, 1990 [with D.W. Gillen and T.H. Oum].
7. "Peak Period Pricing: An Idea Whose Time Has Come," *Air Transport Management*, Vol. 2(1), January/February 1990, pp.16-17.
8. "New Runways and the Environment," *Air Transport Management*, Vol. 3(1), March/April 1990, p.19.
9. "Prom Night: Choosing Partners for the Global Airline Dance," *Air Transport Management*, Vol. 3(2), May/June 1990, pp. 13-19.
10. "On the Urge to Merge," letter to editor, *Policy Options*, Vol. II(5), June 1990.
11. "Regionalism in International Air Regulations," Working Paper 92-TRA-011, Faculty of Commerce and Business Administration, The University of British Columbia, Vancouver, December 1992.
12. "The Role of the Airport in the Post-Resource Economy," published as a working paper of the Vancouver International Airport, and forthcoming as an appendix to the airport's strategic plan. First published June 1994.
13. "Open Skies at Last," forthcoming in *Connector*, Canadian Business Travel Association, June 1995.
14. Many articles written for YVR Skytalk under pen name of Harold Michaels.

K. Book Reviews

1. Sigafos, R.A. (1984), *Absolutely, Positively Overnight: The Story of Federal Express*, review appeared in *Logistics and Transportation Review*, Vol. 21, (2), June 1985, pp. 185-187
2. Nance, J.J. (1984), *Splash of Colors*, review appeared in *Logistics and Transportation Review*, Vol. 21 (2), June 1985, pp. 185.
3. Morrison, S. and C. Winston (1986), *The Economic Effects of Airline Deregulation*, review appeared in *Logistics and Transportation Review*, Vol. 23 (1), March 1987, pp. 135-136.
4. Bailey, E.E., D.R. Graham and D.P. Kaplan (1985), *Deregulating the Airlines*, review appeared in *Logistics and Transportation Review*, Vol. 23 (1), March 1987, pp. 135.
5. Shaw, S. (1988), *Airline Marketing and Management*, review appeared in *Logistics and Transportation Review*, Vol. 25 (2), June 1989, pp. 183-185.
6. Small, K.A., C. Winston and C. Evans (1989), *Road Work: A New Highway Pricing and Investment Policy*, review appeared in *Logistics and Transportation Review*, Vol. 25 (4), December 1989, pp. 375-376.
7. Chesen, J.R. (1989), *Canadian-American Air Service Negotiations: Ending the Gridlock*, review appeared in *Logistics and Transportation Review*, Vol. 26 (3), September 1990, forthcoming.
8. Wells, A.T. and B.D Chadbourn (1987), *General Aviation Marketing*, review forthcoming in *Logistics and Transportation Review*.

L. Computer Program Papers and Reference Manuals

1. "Time Series Processor at the University of Wisconsin (TSP-WISC)," Computer manual available from Madison Academic Computing Center, University of Wisconsin-Madison, October 1977, June 1978, [with D.W. Caves].
2. "Econometric Estimation Using the Time Series Processor at the University Wisconsin (TSP-WISC)," SSRI Discussion Paper #7711, Department of Economics, Madison, September 1977, [with D.W. Caves].
3. "Time Series Processor at the University of Wisconsin, Programmer's Reference Manual," mimeo., Department of Economics, University of Wisconsin-Madison, July 1979, [with C. Franklin].
4. *Econometric Programming Language: User's Manual*, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, November 1980, [with D.W. Caves].

5. Econometric Programming Language: Reference Manual, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, December 1981.
6. *Econometric Programming Language: Primer*, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, March 1981.
7. *Econometric Programming Language: Programmer's Reference Manual*, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, August 1981, [with S.A. Novogoratz].

PAPERS PRESENTED AT CONFERENCES

1. "Total Factor Productivity of U.S. Trunk Air Carriers, 1972-1977," presented at NSF sponsored conference on Productivity Measurement in Regulated Industries, May, 1980.
2. "A Reexamination of Scale Economies for U.S. Trunk Airlines," presented at Econometric Society, Denver, September, 1980.
3. "The Influence of Ownership Form and Regulation on Economic Performance: Canadian and U.S. Railroads in the Postwar Period," presented at IRPP conference on Managing Public Enterprises, Vancouver, August, 1981.
4. "Economies of Density and the Effects of Network: A Revaluation of Scale Economies for U.S. Trunk Airlines," presented at the Econometric Society, New York, December, 1982.
5. "Productivity Effects of Mergers in the U.S. Rail Industry: Economies of Density versus Economies of Firm Size," presented at the Econometric Society, San Francisco, December 1983.
6. "An International Comparison of Airlines," presented at Canadian Transportation Research Forum, Jasper, Alberta, May 1984.
7. "Identifying and Measuring the Impact of Government Ownership and Regulation on Airline Performance," Research Conference on Government Enterprise, Toronto, November, 1984.
8. "Measuring and Identifying the Causes of the Productivity Performance of the Canadian Class I Railroads," presented at Canadian Transportation Research Forum, Toronto, May, 1985.
9. "Hedonic versus General Specifications of the Translog Cost Function," presented at Canadian Economic Association Meetings, University of Montreal, May, 1985.

10. "Hedonic versus General Specifications of the Translog Cost Function," presented at Econometric Society 5th World Congress, Massachusetts Institute of Technology, Boston, August 1985.
11. "An Assessment of the Efficiency Effects of U.S. Airline Deregulation Via an International Comparison," presented at NSF sponsored conference on Regulation of the Crossroads, Airlie, Virginia, September 12-14.
12. "Productivity Differences Between U.S., Canadian and Non-North American Airlines: The Effect of Deregulation," World Conference on Transport Research, Vancouver, May, 1986.
13. "Entry Barriers and Anti-competitive Behavior in a Deregulated Canadian Airline Market," Canadian Transportation Research Forum, Vancouver, May, 1986.
14. "Airline Seat Management," presented at Canadian Transportation Research Forum, Vancouver, May, 1986.
15. "Impact of Deregulation on Railway Labour Employment, Productivity and Compensation," presented at Canadian Transportation Research Forum, St. John's, Newfoundland, June, 1987.
16. "Airline Hub and Spoke Systems," presented at Canadian Transportation Research Forum, St. John's, Newfoundland, June, 1987.
17. "Airport Pricing Policies: An Application to Canadian Airports," presented at Canadian Transportation Research Forum, St. John's, Newfoundland, June, 1987.
18. "The Changing Role of IATA: Prospects for the Future," presented at workshop on "Frontiers in Transportation Research," Washington State University, June, 1987.
19. "Total and Variable Factor Productivities: Relationships to Cost Function Estimation," presented at Canadian Economics Association meetings, Hamilton, Ontario, June, 1987.
20. "Ramsey Pricing in the Presence of Externalities," presented at Canadian Economics Association meetings, Hamilton, Ontario, June, 1987.
21. "Cost Function Estimation, Economists Versus the Practitioners: An Exploratory Analysis," presented at Western Economics Association Meetings, Vancouver, B.C., July, 1987.
22. "Productivity in the U.S. Trucking Industry: The Early Deregulation Experience," presented at Western Economics Association meetings, Vancouver, B.C., July, 1987.
23. "Airline Cost Structure: A Multiproduct Approach for Canadian Airlines," presented at

Western Economic Association meetings, Vancouver, B.C., July, 1987.

24. "Economic Performance of the Canadian Pulp and Paper Industry: 1963-1982," presented at United Nations FAO/ECE Working Party on Forest Economics and Statistics, Palais des Nations, Geneva, February, 1988.
25. "Timing Models for Services Marketing," presented at ORSA/TIMS Marketing Science Conference, Seattle, March 1988.
26. "The Canada-U.S. Air Transport Bilateral: Will It Be Freed?" presented at Canadian Transportation Research Forum, Minaki, Ontario, May, 1988.
27. "Duopoly in Canada's Airline Industry: Consequences and Policy Issues," presented at Tenth Annual Conference of the Association for Public Policy Analysis and Management, Seattle, 28 October 1988.
28. "Airport Pricing Principles," presented at Transportation Research Forum, Toronto, 11 November 1988.
29. "Comparing the Productivity Performance of Canada, U.S. and Sweden in the Pulp and Paper Industry," presented at Canadian Pulp and Paper Association 43rd annual meetings, Human Resources Section, Vancouver, 19 September 1989.
30. "Deregulation and Airline Employment: Myth versus Fact," response for book reviewer comments, Transportation Research Forum, Williamsburg, Va., 12 October 1989.
31. "Airline Hub and Spoke Systems," presented at Transportation Research Forum, Williamsburg, Va., 13 October 1989.
32. "Modelling and Testing the Effect of Market Structure on Price: The Case of International Air Transport," presented at American Economic Association meetings, Atlanta, Ga., 29 December 1989.
33. "Canada and the Changing Regime in International Air Transport," presented at Conference on Canada and International Economic Regimes: A Critical Appraisal, University of British Columbia Institute for International Relations, Vancouver, B.C., 31 May 1990.
34. "Price Discrimination and Economics of Scope: Are Current Airline Practices Socially Optimal?" presented at Canadian Economics Association, Victoria, B.C., 3 June 1990.
35. "Canadian Airline Deregulation," presented at Canadian Transportation Research Forum, Saskatoon, June 1990.
36. "Productivity Adjustment to Price Levels in Regulated Rail Markets: Recent Developments in Canada and the United States," presented at Canadian

- Transportation Research Forum, Saskatoon, June 1990.
37. "Globalization of the Airline Industry and Implications for Canada," presented at Canadian Transportation Research Forum, Saskatoon, June 1990.
 38. "Canadian Airline Deregulation and Its Economic Effects," presented at Transportation Research Forum, Long Beach, October 1990.
 39. "Technology, Marketing and Policy: The Advent of the Globalized Airline Industry," presented at B.C. Aviation/Canadian Transportation Research Forum annual B.C. Aviation Seminar, Vancouver, 1 May 1992.
 40. "Airline Globalization: The Strategic Games of the 1990s" presented at Alliance of Canadian Travel Associations, Winnipeg, 10 May.
 41. "The Advent of the Globalized Airline Industry," presented at Canadian Airlines International, European Studies Program, Vancouver, 24 May 1991.
 42. "The Logistics of Scrap and Waste Disposal," presented at Canadian Transportation Research Forum, Quebec City, 30 May 1991.
 43. "From the People Who Brought You Airline Deregulation, Now Comes Airline Globalization," presented to Association of Professional Economists, Vancouver, 11 June 1991.
 44. "Globalization of the Airline Industry," presented at Pacific Rim Council on Urban Development, Vancouver, 7 October 1991.
 45. "The Global Context: The Advent of the Globalized Airline Industry," keynote speech, presented at British Columbia Airports workshop, Prince Rupert, B.C., 15 November 1991.
 46. "Monopoly versus Duopoly in Canadian Air Transport," presented at Transportation Research Forum, New Orleans, 1 November 1991.
 47. "U.S. Railroad Productivity After Staggers," presented at Transportation Research Forum, New Orleans, 1 November 1991 [with W.G. Waters II, who made the presentation].
 48. "Report of the Ministerial Task Force on International Air Policy," presented to Vancouver International Airport community, 6 March 1992.
 49. "Globalization of the Airline Industry," presented at the 1992 North American Avionics Maintenance Conference, Vancouver, 24 March 1992.
 50. "Restructuring the Canadian Airline Industry: Historical and Global Perspectives," presented at the annual meeting, Western Transportation Advisory Council, Winnipeg, 26 March 1992.

51. "Changes to Air Transport in the 1990s: Implications for Non-Metropolitan Airports," presented at "Westcoast Vision," 1992 annual conference of the Economic Development Association of B.C., Campbell River, B.C., 6 April 1992.
52. "Addressing Critical Transportation Issues: the Structure of the Airline Industry" presented at 1992 Annual Meeting of the Western Transportation Advisory Council, 26 March 1992, Winnipeg.
53. "Canada's Airline Industry: Merging, Seeking Foreign Investment, or Going it Alone: Overview," presented at B.C. Aviation Seminar, Vancouver, 14 May 1992.
54. "Global Consolidation Forces in the World Airline Industry," presented at World Conference on Transportation Research, Lyon France, 1 July 1992.
55. "Aviation Opportunities: Bilateral Obstacles," presented at Asia Pacific Foundation Conference, 22 April 1993.
56. "Multilateral Air Services Agreements," presented at Pacific Economic Cooperation Council, March 1994, Kuala Lumpur.
57. "Globalization and Telecommunications Innovation," presented to Canadian Airlines Sales Conference, April 1994.
58. "Airline Globalization" presented to Conference on International Air Transport, Canberra, May 1994.
59. "Do Airports Compete?" presented at Canberra Australia to intergovernmental task force, May 1994.
60. "Rail Issues," presented to Bureau of Transport and Communications Economics," Canberra, May 1994.
61. "Air Transport to the Year 2000," presented to "Creating Tomorrow", conference of the Council of Canadian Airline Employees, June 1994.
62. "Airports in the 1990s: Changing government priorities lead to commercialization," presented to Association of Canadian Travel Executives, 19 October 1994, Vancouver.
63. "Paradigm Shift: the global change in the role of airports in the economy," keynote speech to the 1995 conference of the British Columbia Association of Canadian Travel Agents, March 1995.
64. "Open Skies and what it means for Canada," presentation to the 1995 British Columbia meeting of the Canadian Business Travel Association. April 1995.
65. Numerous presentations at conferences from 1996 onwards, including Airports

Council International - North America, Airports Council International – Pacific, International Air Transport Association Legal Conference, Canadian Business Travel Association, Alliance of Canadian Travel Agents, Association of Canadian Travel Executives, Canadian Airports Council, Federal Aviation Administration Forecasting Conference, Asia Pacific Economic Cooperation, Pacific Economic Cooperation Council.

OTHER CONFERENCES

1. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, March 1984. Conference organizer, session chair.
2. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, April 1985. Conference organizer, session chair.
3. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, April 1986. Conference organizer, session chair.
4. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, April 1987. Conference organizer, session chair.
5. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, May 1988. Conference organizer, session chair, rapporteur.
6. Western Economics Association, July 1987, Vancouver. Discussant at 3 sessions, chair of 1 session.
7. Western Economics Association, July 1988, Los Angeles. Discussant.
8. Canadian Network on Productivity, March 31 - April 1, 1989. Co-Director.
9. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, April 1989. Conference organizer, session chair.
10. Improving Grain Logistics: Barriers to Change, conference organized by UBC Centre for Transportation Studies, Vancouver, April 17-18, 1989. Participant.
11. International Northwest Aviation Conference, August 1989, Fairmont Hot Springs, B.C. session chair, rapporteur.

12. Annual B.C. Aviation Seminar, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, 25 April 1990. Conference organizer, session chair.
13. Canadian Economics Association, Victoria, B.C., 1-3 June 1990. Session chair, paper discussant.
14. Alberta Symposium on Future Intercity Passenger Transportation, University of Calgary, 28 June 1990. Panelist.
15. Vancouver International Airport Marketing Development, Vancouver 15 February 1991. Panelist.
16. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, March 1991, Conference organizer, session chair.
17. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, March 1992, Conference organizer, session chair.
18. World Conference on Transportation Research, Lyon France, 29 June - 3 July 1992. Program committee, session organizer.
19. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, March 1993, Conference organizer, session chair.
20. Annual B.C. Aviation Conference, Vancouver, jointly sponsored by UBC Centre for Transportation Studies, Canadian Transportation Research Forum, and B.C. Aviation Council, April 1994, Conference organizer, session chair.
21. World Conference on Transportation Research, Sydney Australia, July 1995, session organizer, session chair.

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

Kevin Caskey - 1987

Tony Roberts - 1994

Saskia Roukema - 1995e

Guy Maclaren (MPlan) - 1991

Heather Romank - 1995e

Todd Kurtin - 1984

Chris Christopherson - 1984

Marie Trepannier - 1985

Eva Busza (MA) - 1987

Reagan Pratt - 1993

MBA Paper Supervisor

Greg Saretsky - 1984

Patricia Dusting - 1985

Donna Chin - 1985

David Campbell - 1985

Roger McLaughlin - 1985

Peter Kutney - 1986

Gary Jung - 1986

Ming Ho - 1986

Jim Blatchford - 1986

Tomo Adachi - 1993

Jeannette Godin - 1986

Nancy Keen - 1987

Susan Sinott - 1987

Terry David - 1988

William Chan - 1988

Edward Chan - 1988

Linda Moore - 1989

Roger Purdy - 1989

John Korenic - 1990

Neal Chinaleong - 1994

Peter Leighton - 1990

Debra Stephan - 1990

Cheryl Trepanier - 1990

Paul Ouimet - 1991

Mike Bendarz - 1991

Sean Strugnell - 1992

Brett Patterson - 1992

Ted Gadsden - 1992

Bob Beck - 1992

Dale Mortimer - 1995

EXTERNAL RESEARCH GRANTS

NSERC (1986-1989) (\$13,000 per year)

SSHRC (1984) (\$20,000)

SSHRC (1986-1989) (\$20,000 per year)

SSHRC (1990-1993) (\$14,000 per year)

SSHRC (1992-95) (\$50,000 per year)

Employment Canada (1986) (\$125,000)

Employment Canada (1987) (\$98,000)

Transport Canada (1983) (\$ 6,000)

Transport Canada (1983) (\$20,000)

Transport Canada (1984) (\$20,000)

Transport Canada (1985) (\$54,000)

Transport Canada (1990) (\$19,000)

Transport Canada (1991) (\$29,600)

Transport Canada (1991) (\$21,000)

SSHRC (1995-97) (\$30,000 per year), principal investigator, "Gateway Productivity"

SSHRC (1995-97) (\$15,000 per year), co-investigator, "Total Price Productivity"

Contract research has been conducted for:

Air B.C. Master Executive Council (1994)
Air Crew Association of Canada (1989, 1990)
Alberta Economic Development (1988)
Alberta Transportation and Utilities (1992)
Association of American Railroads (1988, 1989, 1990, 1991, 1992, 1993)
British Airways (1994-95)
B.C. Ministry of Regional Economic Development (1987)
Canadian Airline Pilots Association (1987)
Canadian Airports Council (1996-2002)
Consumer and Corporate Affairs Canada
(1986, 1987, 1988, 1989, 1990, 1991, 1992, 1994, 1995)
(Bureau of Competition Policy)
Consumers Association of Canada (1987)
Goepel Shields and Partners (1994)
Horizon Pacific Management (1988)
Ministerial Task Force on International Air Policy (1990, 1991)
Pemberton Houston Willoughby (1987, 1988)
Qantas Airways (1994, 1995)
Stanley Associates Engineering (1986)
Trade and Transportation Group (1987)
Transport Canada (1986, 1987, 1988, 1990, 1991)
U.S. Civil Aeronautics Board (1980)
Vancouver International Airport (1989, 1990, 1994)
Western Diversification Fund (1988)

In addition, numerous contract research studies have been conducted for clients of InterVISTAS Consulting Inc.

UNIVERSITY SERVICE

Faculty of Commerce:

Appointment Promotion and Tenure Committee (1988/89, 1993/94)
Classroom Planning Committee (1994)
Computing Resources Committee
(1984/85-chair, 1985/86, 1986/87, 1987/88, 1988/89, 1989/90)
Curriculum Committee (1989/90, 1990/91-chair, 1991/92-chair, 1992/93-chair)
Faculty Retreat Committee (1990-chair)
Merit Committee (1988,1991)
Teaching Development Committee (1986/87, 1987/88, 1989/90, 1991/92-chair, 1992/93-
chair)
Teaching Evaluation Review Committee (1993)
Teaching Development Fund Committee (1994-95)
Undergraduate Program Review Committee (1991/92)
Instructor in Summer Program in International Business in France

(1991, 1992, 1993, 1994)

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)

Treasurer, UBC Childcare Society (1988/89, 1989/90)

Vice President, UBC Childcare Society (1990/91)

Campus Classroom Planning Committee (1994)

Internal Ph.D. exam reviewer: G. Papatheodorou (1989)

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

Journal of Industrial Economics

Journal of Political Economy

Journal of Public Economics

Journal of the Transportation Research Forum
Logistics and Transportation Review
Managerial and Decision Economics
Papers of the Regional Science Association
Quarterly Journal of Business and Economics
Quarterly Review of Economics and Business
Social Science and Humanities Research Council of Canada
Transport Reviews
Transportation Research
Water Resources Research

Reviewer for following publishers:

MIT Press
North Holland Publishers
Transport Research Centre, Australia
Irwin Books
McGraw Hill

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)

Expert Testimony submitted to:

Australia Consumer and Competition Commission
Australian Trade Practices Commission
Canada Transportation Act Review Panel
Canadian Competition Tribunal
Canadian House of Commons Standing Committee on Transport
Canadian Labour Relations Board
Canadian National Transportation Agency
Commission of Inquiry on Canadian University Education
Federal Court of Canada
New Zealand Commerce Commission
Private Labour Arbitration Hearings
Royal Commission on Passenger Transportation
South African Civil Aviation Administration
U.S. Interstate Commerce Commission
U.S. Federal Court, antitrust trial

(I have never been rejected as an expert witness by a tribunal, court or government agency)

Invited Presentations made to

Airports Council International – North America
Airports Council International – Pacific
Airports Council International - World
Asia Pacific Economic Co-operation, Transportation Working Group
Asia Pacific Foundation
Association of Canadian Travel Agents (BC)
Association of Canadian Travel Agents (National)
Association of Canadian Travel Executives
Association of Professional Economists
Australian Bureau of Transport and Communications Economics
Alliance of Canadian Travel Agents
BC Airports Workshop
BC Aviation Council
BC Law Association
Canadian Airlines International
Canadian Airports Council
Canadian Regional Airlines
Canadian Airlines International/Lufthansa
Canadian Business Travel Association
Chartered Accountants
Council of Canadian Airline Employees
Council of Tourism Associations of British Columbia
Financial Executives Institute
International Air Transport Association
Pacific Economic Cooperation Council
Washington State Air Transport Committee
Vancouver International Airport
North American Avionics Maintenance Conference
Economic Development Association of B.C.
Western Transportation Advisory Council
Stetnor (Telecom Canada)
Tourism Industry Association of Canada
Vancouver International Airport
Wardair Canada Ltd.
Young Presidents Organization

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

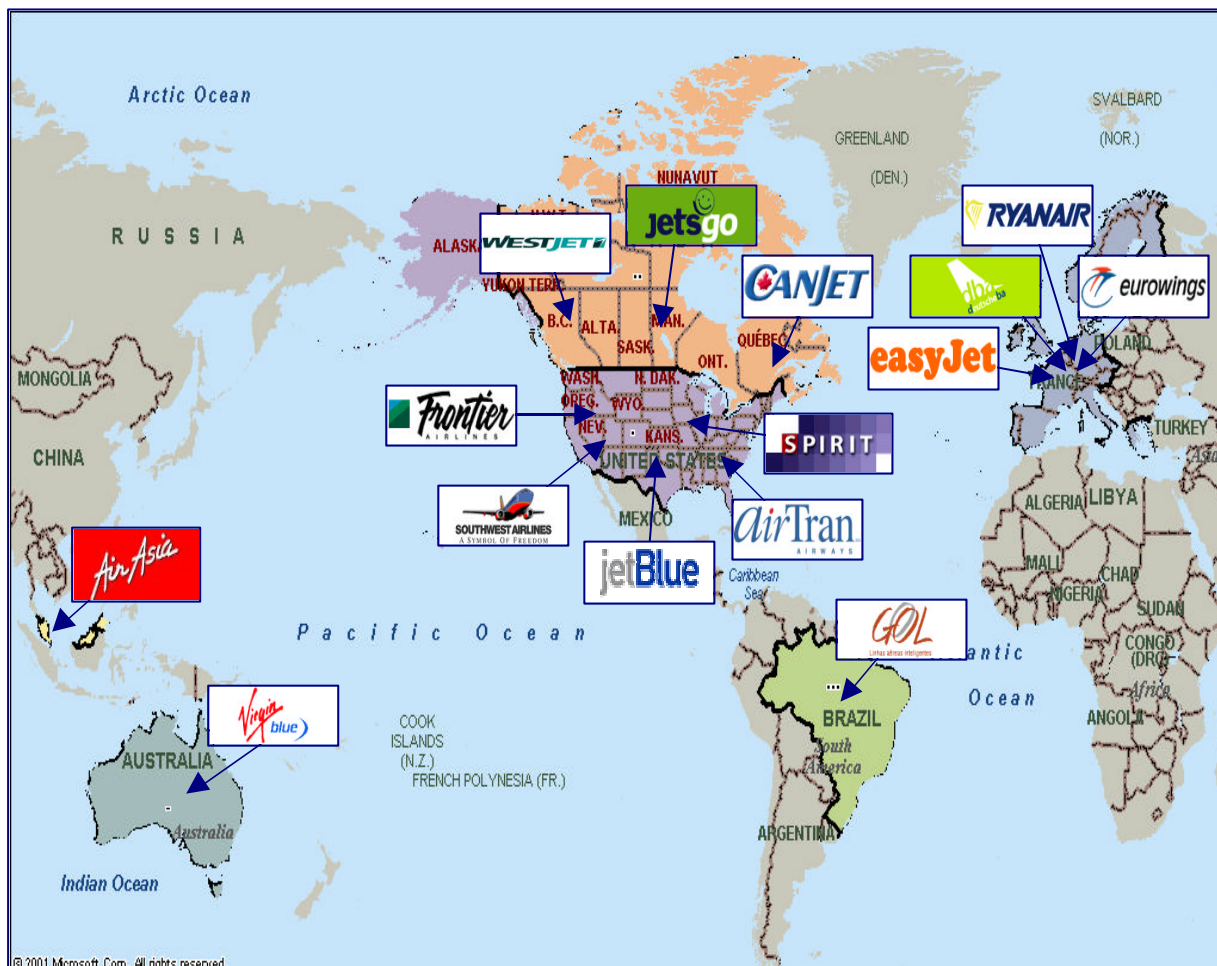
Short Course Instruction at Other Universities

Shanghai Jiaotong University
Sian Jiaotong University
Nankai University
Universite Canadienne en France

Short Courses Taught for International Management Training Institute

Hong Kong
Madrid
Montreal
Penang Malaysia
Rio de Janeiro
Vancouver

Appendix B: The Global Emergence of the Low Cost Carrier



Appendix C: Selected LCC Aircraft Orders

Summary of Low Cost Carrier Aircraft Options and Orders

Airline Name	Aircraft Type	Options	Orders
Air Tran Airways	Boeing 717-200	4	9
	Boeing 737-700	50	28
	Total	54	37
EasyJet	Airbus A319-100	120	115
	Boeing 737-700		8
	Total	120	123
EasyJet Switzerland	Airbus A319-100		5
	Total		5
Eurowings	Airbus A319-100		1
	Total		1
Frontier Airlines [CO-USA]	Airbus A318-100		3
	Airbus A319-100	6	
	Total	6	3
JetBlue Airways	Airbus A320-200	50	105
	Embraer 190 (ERJ 190-100)	100	100
	Total	150	205
Ryanair	Boeing 737-800	125	117
	Total	125	117
Southwest Airlines	Boeing 737-700	77	113
	Total	77	113
Virgin Blue Airlines	Boeing 737-800	40	10
	Total	40	10
WestJet	Boeing 737-700	44	19
	Total	44	19
Low Cost Carriers Total		616	633

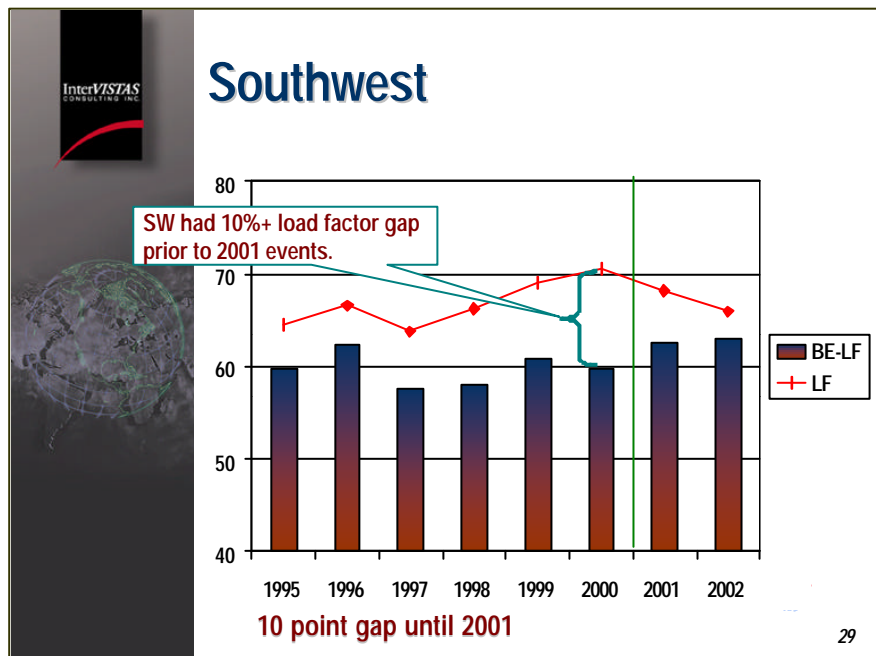
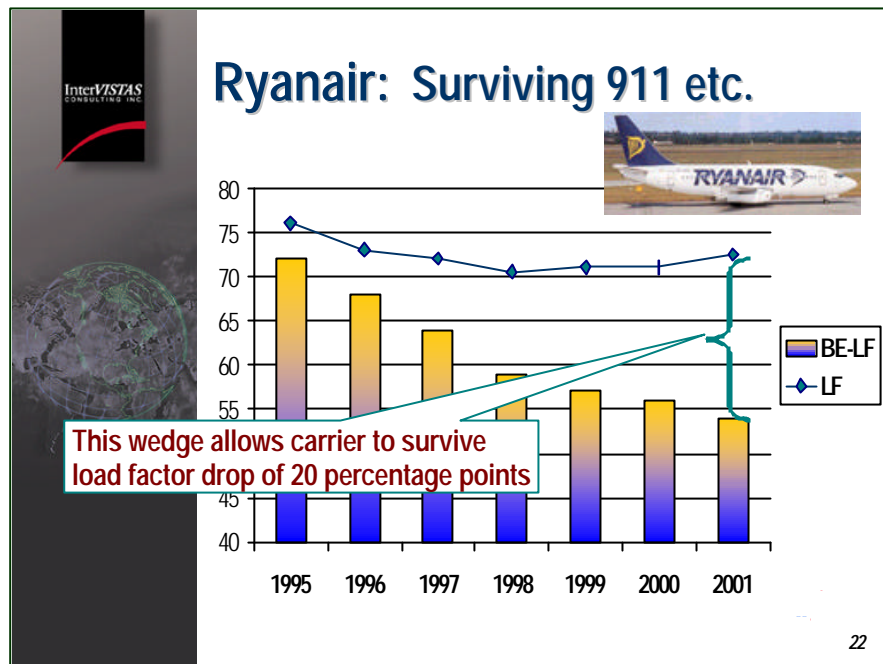
Source: BACK Aviation Solutions/Lundkvist Fleet Database.

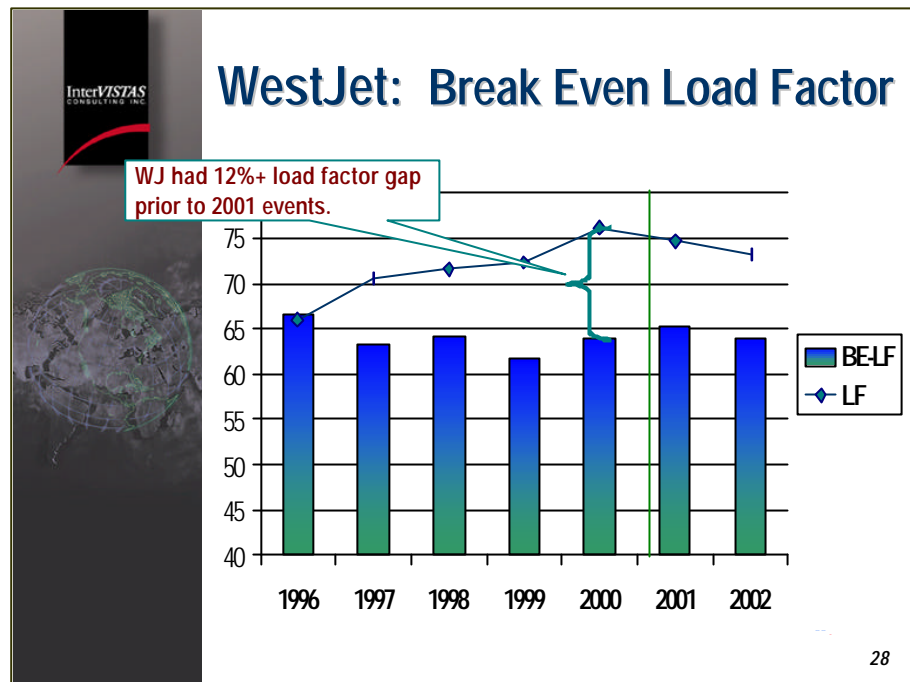
Note: Options and orders include aircraft that have not been delivered as of July 5th, 2003.

Appendix D: Market Capitalisations of Selected Airlines

Market Capitalisations As of 21 July 2003	
Air Carrier	Market Capitalisation
Europe <i>US\$ million</i>	
Ryanair	\$5,085
Lufthansa	\$4,190
British Airways	\$2,955
KLM	\$424
Canada <i>CA\$ million</i>	
WestJet	\$1,275
Air Canada	\$107
US <i>US\$ million</i>	
Southwest	\$13,226
Jet Blue	\$2,735
American	\$1,639
Delta	\$1,541
Continental	\$ 937
Air Tran	\$818
Alaska	\$606
Frontier	\$372
United	\$57

Appendix E: Selected LCC Actual and Break-even Load Factors





Sources: Carrier Annual Reports,
InterVISTAS Consulting Inc. computations.