MEASURING SUCCESS: THE SEARCH FOR ASSESSMENT CRITERIA IN DETERMINING THE IMPACT OF DEREGULATION IN REGIONAL AVIATION

ATRS Paper No. 310

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ABSTRACT

Regional aviation is considered critical to the development of regional and remote communities. It has been recognized by the Australian, Brazilian and Canadian governments that regional aviation is also crucial to the continued economic development of these countries. Whilst all three countries have similar economic structures, they have also completed a cycle of regional aviation deregulation over the last twenty years. A comparative analysis of the economic regulatory reforms conducted in Australia, Brazil and Canada has been provided. The paper uses this analysis to suggest the development of four criteria (improved service quality, increased competition, increased efficiency and increased innovation), to determine the impact of government economic policy on regional aviation.

KEYWORDS

Deregulation, regional aviation, Australia, Canada, Brazil.

INTRODUCTION

Regional aviation is considered critical to the development of regional and remote communities. To many of these communities, the local airport is symbolic of success. In addition, the local airport can further lead to the development of business within the region. Thus, regional aviation is central to the economic and social well-being of these communities.

Australia, Brazil and Canada are countries that share many similarities. All hold relatively similar land areas, an abundance of natural resources, cultivate similar agricultural products and are major exporters of these natural resources and agricultural products (CIA n.d.). In addition, all three countries have experienced the impact of deregulation of the aviation industry in the last twenty years. In all three countries, regional aviation has been impacted by the regulation and deregulation of the airline industry.

The success of deregulation in Australia, Brazil and Canada is still the subject of considerable debate. While empirical and quantitative data supports the general

success of the deregulation model in the regional aviation sector, a wide body of qualitative literature highlights a dissatisfied sector of the industry.

This paper examines Australia, Brazil and Canada as case studies, considering each country's deregulation process applicable to the regional aviation sector in terms of government objectives and outcomes. In this review, two distinct and contradictory views of deregulation have emerged; advocates of deregulation and opponents of deregulation (Noam 1993). The first view is seen predominately as the motivation of federal government strategies to implement this model. However, when assessing the impact of deregulation, both views are seen in the post-deregulation studies.

Many authors attest to the benefits of deregulation. Some claim that deregulation has achieved the intended outcomes. Others cite partial success, claiming that some benefits of deregulation have been achieved. Yet deregulation has also presented some unforeseen surprises. Such is the case with the resulting move towards re-regulation in some segments of the aviation industry in Brazil and in Canada.

The governments of the three countries examined have been motivated towards a model of deregulation by a variety of factors. Each country's experience, post-deregulation has been heavily debated. The investigation of economic regulatory reforms, combined with a review of the current status of regional aviation within these three countries, provides a platform for the development of criteria to determine the impact of government economic policy on regional aviation.

METHODOLOGY

The research aims to contribute to the body of knowledge on deregulation of the aviation industry. In particular, the paper aims to review how regional aviation is affected by government economic policy. Whilst quantitative approaches will indicate the sectors growth and decline in various areas, this research aims to apply qualitative methods.

Through the literature review, firstly, the qualitative method is useful in highlighting limitations, complexities and the interrelation of aviation policies on this sector of the industry. Thus, the qualitative method assists in informing the selection of criteria to assess the impacts of policy implementation. Secondly, this methodology is necessary in the investigation of the sensitive nature of some policy implementation in this sector of the industry, which cannot be quantified. Finally, the qualitative method enables the investigation development processes and the complex interaction between contexts, governmental aspirations and strategies and the variety of interventions used within regional aviation in the last decade.

One significant factor affecting the comparative results of qualitative data is the apparent blurring of "regional and trunk" carriers throughout the process of deregulation. In Brazil and Canada, the geographical restrictions placed on regional carriers and the gradual lifting of these limitations through the liberalization process has made it difficult to ascertain quantitative data. In Australia, the inconsistencies in definitions when referring to regional airlines, air routes and airports also make it difficult to make appropriate comparisons of historical data.

Never-the-less, the qualitative data that has been reviewed appears to support the emergence of four criteria to be used in determining the impact of deregulation in

regional aviation. Qualitative data, in the form of post-deregulation studies, has been examined. Available quantitative data, in the form of historical statistics appropriate to regional aviation operations, has also been reviewed.

DISCUSSION

Comparing Australia with Brazil and Canada

Australia, Brazil and Canada are countries with many similarities. All hold relatively similar land areas, an abundance of natural resources, produce similar agricultural products and are major exporters of these natural resources and agricultural products. Figure 1 and Figure 2 assist in comparing the three countries.

	Canada	Australia	Brazil
Land area	9,093,507 sq km	7,682,300 sq km	8,459,417 sq km
Agriculture¹	2	4	6.1
Industry¹	20	24.8	26.4
Services¹	78 ²	71.2 ²	67.5 ²
GDP –per capita⁵	\$39,600	\$41,300	\$10,900 ⁶
Natural resources	Iron ore, nickel, zinc, copper, gold, lead, rare earth elements, molybdenum, potash, diamonds, silver, fish, timber, wildlife, coal, petroleum, natural gas, hydropower	Bauxite, coal, iron ore, copper, tin, gold, silver, uranium, nickel, tungsten, rare earth elements, mineral sands, lead, zinc, diamonds, natural gas, petroleum	Bauxite, gold, iron ore, manganese, nickel, phosphates, platinum, tin, rare earth elements, uranium, petroleum, hydropower, timber
Agriculture products³	Wheat, barley, oilseed, tobacco, fruits, vegetables; dairy products; forest products; fish	Wheat, barley, sugarcane, fruits; cattle, sheep, poultry.	Coffee, soybeans, wheat, rice, corn, sugarcane, cocoa, citrus; beef
Industries⁴	Transportation equipment, chemicals, processed and unprocessed minerals, food products, wood and paper products, fish products, petroleum and natural gas	Mining, industrial and transportation equipment, food processing, chemicals, steel	Textiles, shoes, chemicals, cement, lumber, iron ore, tin, steel, aircraft, motor vehicles and parts, other machinery and equipment
Imports commodities	– Machinery and equipment, motor vehicles and parts, crude oil, chemicals, electricity, durable consumer goods	Machinery and transport equipment, computers and office machines, telecommunications equipment and parts, crude oil and petroleum products	Machinery, electrical and transport equipment, chemical products, oil, automotive parts, electronics
Import – partners	US 51.1%, China 10.88%, Mexico 4.56% (2009)	China 17.94%, US 11.26%, Japan 8.36%, Thailand 5.81%, Singapore 5.54%, Germany 5.3% (2009)	US 16.12%, China 12.61%, Argentina 8.77%, Germany 7.65%, Japan 4.3% (2009)

Exports commodities	– Motor vehicles and parts, industrial machinery, aircraft, telecommunications equipment, chemicals, plastics, fertilizers, wood pulp, timber, crude petroleum, natural gas, electricity, aluminum	Coal, iron ore, gold, meat, wool alumina, wheat, machinery and transport equipment.	Transport equipment, iron ore, soybeans, footwear, coffee, autos
Exports – partners	US 75.02%, UK 3.37%, China 3.09% (2009)	China 21.8%, Japan 19.19%, South Korea 7.88%, India 7.51%, US 4.95%, UK 4.37%, NZ 4.1% (2009)	China 12.49%, US 10.5%, Argentina 8.4%, Netherlands 5.39%, Germany 4.05% (2009)
Population	34,030,589 (July 2011 est)	21,766,711 (July 2011 est)	203,429,773 (July 2011 est)
1. GDP - composition by sector This entry gives the percentage contribution of agriculture, industry, and services to total GDP. The distribution will total less than 100 percent if the data are incomplete.			
2. (2010 est)			
3. This entry is an ordered listing of major crops and products starting with the most important.			
4. This entry provides a rank ordering of industries starting with the largest by value of annual output.			
5. This entry shows GDP on a purchasing power parity basis divided by population as of 1 July for the same year.			
6. (2010 est). Data are in 2010 US dollars			

Figure 1 – Economic and geographic comparisons of Canada, Australia and Brazil, Source: CIA, n.d.

	Canada	Australia	Brazil
Airports – with paved runways			
Total	514	326	726
2438 to over 3047m	38	24	35
1524 to 2437m	148	148	176
914 to 1523m	249	140	460
Under 914m	79	14	55
Airports – with unpaved runways			
Total	890	139	3346

Figure 2 – Airport comparisons of Canada, Australia and Brazil, Source: CIA, n.d.

These economic factors, combined with the countries' geographic features provide the evidence of the essential need for adequate air transport services. When comparing Australia with Canada and Brazil individually, further similarities can be found.

Australia and Canada

Firstly, Canada and Australia are both relatively small countries in terms of population. Australia has a population of 21 million (CIA n.d.), compared to approximately 31 million in Canada (CIA n.d.). Moreover, in 2010, GDP per capita expressed in terms of purchasing-power parity was approximately \$39,600 in Canada,

compared to \$41,300 in Australia, which reflects comparable standards of living (CIA n.d.).

Secondly, the two countries have similar economic structures (Stevens 2009). Machinery and transportation equipment represent approximately half of total imports of both countries (Harchaoui, Jean & Tarkhani 2003). In 2008, exports of goods and services accounted for one third of the GDP in Canada compared to about one quarter in Australia. Commodities form a major portion of the exports in both countries. Canada exports more crude oil, natural gas and forestry products than Australia. Where-as coal, iron ore, nickel, copper and precious metals form the major commodities of Australia (Stevens 2009).

Thirdly, both Canada and Australia hold an abundance of natural resources and the structures of both economies are dominated by the primary sector. Harchaoui, Jean & Tarkhani (2003) state that 55% of Australia's exports are in the form of raw materials, compared with 46% for Canada.

Finally, both countries maintain recording and statistical systems which allow appropriate cross-country comparisons. The productivity programs of Canada and Australia are integrated into their systems of national accounts. Both countries also maintain best practice concepts and methods as outline in the OECD productivity handbook (Harchaoui, Jean & Tarkhani 2003)

Australia and Brazil

Brazil and Australia have a similar structure in terms of the percentage contribution of agriculture, industry, and services to total GDP. Although many Australians consider Brazil a developing economy, Brazil has quite an advanced economy. Trade is one reason for Brazil's success. Brazil has forged strong relations with emerging countries like Asia and Africa and has engaged with developed economies. China has been a major driver for both Australia and Brazil with 79% of Brazilian exports to China being agriculturally based. Similar to Australia, Brazil's exports to the rest of the world are focused on energy and manufacturing (Harcort 2009).

Increasingly, Australia and Brazil are collaborating on a wide range of industries from oil and gas production to agribusiness, ethanol, biotechnology and financial services. Brazil's major export to Australia is the Embraer aircraft.

The Regulation of Aviation in Australia

Since October 1990, the Australian government has transitioned from a direct and interventionist role in the aviation industry (BITRE 2000). The move towards deregulation ended 30 years of government control in capacity, airfares and entry to the industry. An integral part of the microeconomic reform agenda, the policy of deregulation was motivated by the need to 1) see improvements in the quality of air services, 2) promote competitive air fares (BITRE 2008), 3) encourage efficient operators, and 4) encourage innovation (Australian Government 2003). This meant that under the deregulated environment, interstate regional air services have been predominantly operating within broader competition policy controls that apply to other industry sectors (BITRE 2008).

Supported by the Constitution, the policy meant that the state, territory and local governments took on greater responsibility for intrastate aviation (BITRE 2003). Victoria, Tasmania, Australian Capital Territory and Northern Territory have withdrawn regulations of intrastate aviation services, while New South Wales, Queensland, South Australia and Western Australia retain some regulatory restrictions and/or subsidies for some services (BITRE 2008).

The decision to deregulate interstate aviation was made in, what could be considered, a relatively certain environment. This is somewhat different to the type of environment that has existed since then. The decision was also made at a time when some other developing and developed countries were also deregulating their aviation industries (Winston & de Rus 2008).

The following table highlights a few of the many interventions applied to the Australian regional aviation sector over the last twenty years.

Government in Power		Commonwealth interventions applicable to Regional Aviation	
1983	Labor		
		1990	Microeconomic Reform - Deregulation
		1992	Aerodrome Local Ownership Plan
1996	Coalition		
		1996	1996 – 2000 Fuel Excise reduced from 18.5c/l to 2.8c/l
		1997	Protection of regional slots at Sydney's Kingsford Smith Airport
		1998	Subsidy for transition to location-specific pricing for air traffic control towers
		2000	Remote area Service Subsidy Scheme *Since 1957, expanded in 2000.
		2001	Exemption from the Air Passenger Ticket Levy ('Ansett Levy')
		2001	Rapid Route Recovery Scheme
		2001	New Tax System
		2002	CASA receives Special Appropriation funding of \$59 million.
		2002	Subsidising Airservices Australia enroute charges
		2002	Life cap of aircraft of 10 years in the income tax law.
		2006	General Aviation Industry Action Agenda
		2006	Increase in the diminishing value rate for determining depreciation deductions from 150% to 200%
2007	Labor		
		2009	Aviation White Paper
		2009	Announcement: Reduction in Enroute Charges Scheme
		2010	Announcement: Increase in aviation fuel excise from 2.854 c/l to 3.556 c/l

Figure 3 - A review of government policies relevant to Australian regional aviation 1990-2010.

This sector of the industry has been seeking assistance for some time. Themes have been revealed through a plethora of government publications from at least 1980. Data regarding air transport services in regional Australia, published in the late 2000's further support these themes. In 2010, the issues are the same, and many of the policies seem to be cyclical, temporary and/or transient.

Year of Publication	Title of Publication
1980	Basic characteristics of general aviation in Australia
1981	Economic and financial issues associated with general aviation in Australia
1985	Economic regulation of aviation in Australia
1986	Independent review of economic regulation of domestic aviation
1988	Intrastate aviation: performance and prospects
1989	Domestic aviation in transition
1996	General aviation flying in Australia
2001	Ageing aircraft
2003	Making Ends Meet: Regional aviation and island transport services
2003	Regional public transport in Australia: Economic regulation and assistance measures
2007	How Old is Too Old? The impact of ageing aircraft on aviation safety
2007	General Aviation Industry Action Agenda: Issues Paper
2008	Air transport services in regional Australia: trends and access
2009	Air transport service trends in regional Australia (2009 update)

Figure 4 – Government publications investigating the state of regional aviation in Australia (1980-2010)

In 2002, the government at the time sought an inquiry into the commercial regional aviation services in Australia and transport links to major populated islands. It was in the wake of significant events of late 2001, that is, the terrorist attacks in the US and the collapse of Ansett that the House of Representatives Standing Committee on Transport and Regional Services pursued this inquiry. In addition, the committee aimed to link that work to the broader context of regional development in Australia.

The subsequent report, often referred to as “the Neville Report”, found that the issues that are reducing and destabilising regional air services are direct or indirect consequences of deregulation. The report revealed that Commonwealth policy imposed additional costs on the regional aviation industry. The industry was struggling to cope with these costs on top of other, quite significant, external pressures on the industry (Australian Government 2003).

The question of the success of deregulation is still being debated. The impact of deregulation has been researched in a number of studies. Smith & Street (1992), Grimm & Milloy (1993) and the ACCC (1996) all concluded that deregulation was overall successful, commenting that evidence has suggested consumers are happier with lower fares and a higher quality product.

However, Quiggin (1997) concurred that deregulation provided lower fares, but questioned the evidence that deregulation provided efficiency gains. Dellit (2002) also claimed that 10 years after deregulation, the quality of air services had reduced significantly with standards of safety dropping and some services to regional areas in crisis. Again, the Neville report of 2003 supported the concept that deregulation had actually had a “destabilising” effect on regional air services.

It is inevitable that the network nature of aviation has meant that government policy interventions in the domestic aviation industry have led to some impact on the regional aviation sector. There has also been the problem of “blurred boundaries” between regional and main trunk air services. These blurred lines have led to some problems in the definitions associated with regional airlines, associated air routes and airports, which in turn effects interpretations and comparisons of past studies (BITRE 2008).

Never-the-less, when considering government economic intervention, policies associated with government coordination of national aviation policy, taxation on aircraft replacement, fuel costs, airport costs and landing and take off slots have been, and continue to impact on this sector.

Even as recently as September 2010, industry representatives have publically announced their concerns over the complicated nature of various federal, state and local government policies, the cumulative effect of which hinders the ability of the sector to flourish.

The Regulation of Aviation in Brazil

Regulation of the airline industry in Brazil began in the 1960's. The aim of this regulatory model was to encourage mergers between companies, control market entry and route entry, and exercise control over air-fares. Around this time, the first attempts to stimulate regional aviation also occurred with the realization of subsidies for uneconomic routes (Salgado 2005).

Between 1973 and 1986, the Brazilian government established a framework which divided the country into five areas and created the Integrated Systems of Regional Air Transport (SITAR) program. This program provided for four national airlines and five regional airlines (Febeliano, Muller & Oliveira 2006). One of the underlying principles of the SITAR program was the clear demarcation between national and regional air transport providers (Salgado 2005). Whilst the program nurtured the development of the aviation industry, the core of the regulatory model was to ensure market stability by discouraging competition (Febeliano, Muller & Oliveira 2006).

Liberalization of the domestic airline industry commenced in the 1990's. This strategy allowed competition to be introduced via the revision and removal of market segmentations. The period also allowed new competitors to enter the market and the liberalization of air-fares. Control over market concentration was achieved through the restriction of participation on certain routes and access to airport infrastructure.

The government commenced macroeconomic interference in the early nineties for the purposes of inflation stabilization. In 1991, a slight modification of the regulatory environment allowed the entry of new regional airlines, competition between national and regional operators, and removed the countries regional divisions (Salgado 2005).

By the late nineties, the liberalization of the aviation industry had further matured. This was marked by the removal of two regulatory devices: the fare bounds and the preference for regional carriers to operate on special routes (Febeliano, Muller & Oliveira 2006 & Salgado 2005). In 2001, the distinction between regional and national airlines was completely abolished with the introduction of new criteria effectively encouraging competition between carriers.

A new shift in governmental policy is currently taking place. From 2003, recent government strategies indicate a reversal of the liberalization process (Febeliano, Muller & Oliveira 2006). For example, one of these intervention strategies limit the importation of aircraft only to operators with a proven need. This effectively creates an expansion barrier for new market entrants. New directives appear to emphasize the shift of regulatory authorities back to intervention strategies that appeared between the sixties and eighties.

Salgado (2005) highlights the publication of an official statement from the Brazilian Ministry of Defence. The declaration supports the argument that the industry's deregulation period of the 1990's has lead to a market of oversupply leading to predatory competition. The statement indicates that these behaviours make it necessary for the implementation of Federal government initiatives, which modifies the sectors environment to encourage financial stability. It is apparent that fundamental to the concept of re-regulation, is the argument that the process of deregulation leads to predatory behaviour.

Of course, this shift is the subject of considerable debate. Some authors question the legal basis of the policy changes, commenting that the Brazilian government already has an institutional environment which safeguards against competition and the government agencies responsible should action the appropriate processes rather than modifying the entire regulatory environment. The opponents of re-regulation claim that these types of intervention strategies simply aim to provide Federal support of traditional companies (Salgado 2005).

The initial aims of the liberalization process were to; 1) provide the expansion in supply of options to passengers, and 2) to encourage competition between carriers. In Brazil, many studies reject the claim that liberalization increased passenger options or increased competition (Salgado 2005).

According to data provided by the Department of Civil Aviation, regional air transport services increased during the period of deregulation. In addition, the intervention policies introduced by the SITAR program further prevented the demise of the regional air transport sector and it appears that the segment has continued to flourish since 1995.

Febeliano, Muller & Oliveira (2006) comment that the government's intervention strategy allowing new market entrants opened the doors to competition. This competition provided the foundation for the development of service differentiation. This competition also encouraged efforts to segment demand with brand loyalty offerings such as frequent flyer programs, loyalty rewards, improved service, use of more modern aircraft, and also offering basic services at a heavily discounted price.

Overall, data offered by the Department of Civil Aviation appears to indicate that generally, deregulation has provided: (1) an increase in supply of flights leading to increase of options to passengers; (2) an increase in passengers' access to flights; (3) an increase in price competition, allowing different segments of demands to be better met (Salgado 2005).

Although still the topic of great debate, the qualitative and quantitative benefits of re-regulation are yet to be identified.

The Regulation of Aviation in Canada

In the 1960s, the operations of regional air carriers were concentrated to the resource frontier of Canada. Developments in government policy effecting regional aviation in the late 1960s was underpinned by the government's recognition of their unstable financial state and their importance in the development of remote areas (Courtney 1985). As is the case in Brazil and Australia, regional aviation in Canada has been impacted by the regulation and deregulation of the airline industry.

Recognizing the cyclical nature of the resource sector which often provided unstable demand and ineffective network structures, the regional carriers lobbied for principles which complimented domestic air policy. The principles aimed at forming localized regional routes - which fed the national trunk network (Courtney 1985). In the late 1960's, this prompted the government to develop a general set of policies, which provided goals for the development of regional aviation. The aim of the policies was to improve services and stability to allow expansion. Yet regional carriers were limited to regional boundaries.

Regional aviation in Canada grew in the 1970s, but the sector was also feeling the economic effects of the downturn in the resource industry (Courtney 1985). By the end of the 1970's, the cumulative effect of an ageing aircraft fleet, the recession (resulting in a decline in passenger traffic for regional carriers), poor financial performance of regional carriers and resulting mergers and acquisitions, generated the need for a new view on public policy.

Economic regulation was slowly relaxed to allow for competition during the 1970's. In 1978, the airline industry was deregulated in the United States. Canada's air transport industry felt the pressure as passengers turned to U.S. carriers to take advantage of low fares. The Canadian airlines advocated for deregulation to allow them to compete with the U.S. carriers. There was much debate, and opponents argued that deregulation may lead to greater concentration, which may have the effect of reducing competition and increasing air fares (Christopher & Dion 2002). Thus, a measured approach to deregulation resulted with the government commencing a formalized process of deregulation through legislation (Christopher & Dion 2002).

In 1984, the Canadian government announced a new policy statement, which allowed competition on any route in Canada, rather than imposing geographic boundaries of operation (Christopher & Dion 2002). At the time, the government felt that the existing regulatory system did not allow competition, prevented new entrants, hampered innovation, and stifled diversity. The policy provided that "transportation is recognized as a key to regional economic development and commercial viability of transportation links is balanced with regional economic development objectives in order that the potential economic strengths of each region may be realized" (Fiorita 1995, pp. 96).

A position paper was released by the government in 1985 which outlined the proposed changes to the National Transportation Act, 1967. Addressing all modes of transport, the policy aimed to include more competition, reduce economic regulation and increase reliance on market forces to allow competitive pricing and improvements in the range of service offerings (Christopher & Dion 2002, CTARP 2001).

After receiving public comment on the policy proposal, and hearing concern that air services in the north were not mature enough to sustain competition, it was recommended that northern air services continue to be regulated (Christopher & Dion 2002).

Following deregulation, Air Canada and Canadian Airlines consolidated operations and acquired regional and feeder airlines. This allowed the two major carriers, and their affiliated companies to provide extensive route networks (Christopher & Dion 2002)

In the late 1990's, after losing money in eight out of nine years, it became apparent that Canadian Airlines was suffering from the continued competition with Air Canada. In 1999, after review by the Commissioner of Competition, the government supported Air Canada's offer to purchase Canadian Airlines (Christopher & Dion 2002). This meant that regional and cargo operations of the two majors were merged (CTARP 2001).

At this time, the domestic market nurtured the development and expansion of medium sized carriers such as WestJet and Canada 3000. Another charter operator, Air Transat, also expanded its domestic operations. The market also encouraged new entrants, and allowed smaller regional carriers (e.g., Hawkair and Peace Air) to expand their services (CTARP 2001).

In the last decade, fear has been raised over the expiration of the requirement that Air Canada must retain service on former Canadian Airlines routes (Christopher & Dion 2002). Some observers were concerned that the expiration of this requirement would lead to the termination of services to a substantial number of destinations, with a great impact on passengers, communities and small airports (CTARP 2001).

Throughout the 1980s, the Canadian government removed the restrictions allowing air operators to respond to market forces. The major drivers behind deregulation were; 1) the development of a competitive industry, 2) more frequent services, 3) competitive fares that accurately reflected operating costs, and 4) widening of the price range and service offerings (CTARP 2001).

Now, it appears that the overriding concern of Canadian regulatory authorities is the management of competition in the different markets. Ouellette, Petit and Vigeant (2005) highlight a 1979 study of government decision between 1973 and 1978. The study concluded that these decisions bolstered the underlying objective of adequacy and stability of service. However, they also state that this objective led to the "protection of existing carriers and limitations of competition". Interestingly, they go on to state that "control of entry has been the major preoccupation of [the Air Transport Committee's] decisions."

Ouellette, Petit and Vigeant (2005) suggest that Canadian statistics of 1992 indicate that deregulation may have contributed to increasing concentration by allowing carriers to expand. However, deregulation had only a slight positive impact on productivity and spurred the move back towards market domination that resulted in Air Canada absorbing all of its competitors.

Whilst deregulation partially achieved its objectives, Kahn (1988) suggests that it also resulted in a few unforeseen consequences such as discriminatory practices, and re-

concentration. Ouellette, Petit & Vigeant (2005) conclude that post-deregulation studies of the effects of deregulation appear to limit measurements to the carriers' competitive behavior and the structure of the industry. What has been forgotten is the impact of capital injection and associated investment issues.

Criteria for assessing the success of deregulation

The concept of deregulation has not been restricted to the aviation industry. Many industries have experienced the impacts of deregulation, and economists have taken varying positions. Noam (1993) comments that some economists have argued the need to protect the public from high prices and low performance, yet others highlight efficiency losses that result from bureaucracy and regulation. The two views can be generally categorized as "anti-monopoly" and "pro-monopoly".

Anti-monopoly

Those of the "anti-monopoly" view include advocates of the free market. They believe that governments need to establish competition through intervention. Those holding this perspective believe that monopolies are inefficient, and deregulation can assist by allowing the industry to be lead by market forces and competition. According to this view, it is believed that deregulation will result in lower costs, costs that more accurately reflect operating costs, innovation, improved productivity and modernization (Noam 1993).

Pro-monopoly

Those of the "pro-monopoly" view support the natural monopoly and believe that government policy should be used to address any resulting productivity losses.

The first view is seen predominately as the motivation of federal government strategies to implement deregulation in the aviation industry in Australia, Brazil and Canada. However, when assessing the impact of deregulation, both views are seen in the post-deregulation studies.

As highlighted in the above country case studies, many authors have attested to the benefits of deregulation. Some claim that regulation has achieved the intended outcomes. Others are partial, claiming that some benefits of deregulation have been achieved. Yet deregulation has also presented some unforeseen surprises. Such is the case with the resulting move towards re-regulation in some segments of the aviation industry in Brazil and in Canada.

Brazil is debating the unintended protectionist strategies to support failing national airlines. Some, including the Federal government believe that deregulation has lead to predatory behavior and thus resulted in the poor situation of the dominant carrier. However, opponents to this view point out the lack of evidence that deregulation has produced any negative impacts on economic efficiency. While other opponents have stressed that, in terms of economic efficiency, support for failing firms is one of the worst forms of state support.

In Canada, the post deregulation debate focuses on addressing market competition, revealing that deregulation may have spurred the move back towards market domination that resulted in Air Canada absorbing all of its competitors.

In Australia, the regional aviation industry has been lobbying for assistance for many years. Whilst the success of deregulation is still the matter of considerable debate, there is empirical evidence to suggest its overall success. However, the qualitative data, in the form of government commissioned research, and industry action agendas of the last decade indicate a discontent sector of the aviation industry. Although the Federal government has tried to address some of the concerns with the publication, in 2009 of a national aviation policy paper, some advocates of the regional aviation sector maintain that the policy does not adequately address the needs of regional aviation.

In reviewing the evolution of deregulation in the aviation industries of Australia, Brazil and Canada, four criteria have emerged which are fundamental to each government's strategy for the implementation of the deregulation model. As mentioned above, the success of deregulation in all countries is still a matter of great debate. However, in the literature review, some post-implementation dimensions have been revealed by advocates or opponents of the success of this model.

In general, the four criteria which may assist in assessing the impact of deregulation of the regional aviation industry are; 1) improved service quality, 2) increased competition, 3) increased efficiency, and 4) increased innovation.

Improved Service Quality	Increased Competition	Increased Efficiency	Increased Innovation
<ul style="list-style-type: none"> •Frequency of service •Increase in non-stop services •Improvement in on-time-performance •Growth in use of service •Number of regional ports serviced 	<ul style="list-style-type: none"> •Increase in market entrants •Consumer surveys •Evolution of air fares •Variety of product offerings 	<ul style="list-style-type: none"> •Reduction in costs •Rationalization of aircraft size and market size 	<ul style="list-style-type: none"> •Technology (technological services, and technological integration) •Variety of product offerings

Figure 5 – Assessment criteria in determining the impact of deregulation in regional aviation.

Improved service quality

Morrison and Winston (1988) suggest that flight frequency is a key service quality measure, which affects consumer welfare. Linked to this dimension is the measure of growth in supply of services. The first dimension of success, frequency of service allows improved options in departure times and can be measured in terms of available seat kilometers. The second dimension is the increase in non-stop services. Non-stop services allow shorter transit times, which are seen as a benefit to the consumer. An improvement in on-time performance is the third dimension (Grimm & Milloy 1993). Although, this is considered by some authors to benefit the consumer post

deregulation, it is difficult to ascertain quantitative data on regional air carriers. The fourth dimension is a measure of growth in use of air services. This dimension can be measured in terms of revenue passenger kilometers (RPKs) (Salgado 2005). The final dimension of particular importance to regional and remote communities, is the number of regional ports served (Salgado 2005). Although this can be linked to supply of services, it is an important measure that deregulation has addressed issues in terms of viability, sustainability and accessibility of air services (BITRE 2008).

Increased competition

The first dimension of competition measures the success of market entrants post deregulation. Whilst the number of operators servicing particular routes is an important measure, so too is the market share of each competitor. The second dimension, consumer surveys, provides additional qualitative data and allows the assessment of some aspects of deregulation that cannot be quantified such as service levels and consumer satisfaction. While the evolution of airfares, the third dimension, can be considered a measure of increased competition, this dimension is also linked to innovation in terms of market segmentation. While lower fares are an incentive for deregulation, Grimm and Milloy (1993) offer that increases in full fares post deregulation is consistent with yield management strategies. These strategies enforce the need to charge higher prices for the convenience of on demand services. Also related to the operator's understanding of market segmentation, the fourth dimension is a measure of product offerings and includes a review of the aircraft types used over particular routes. For example, the move from turbo props to jet aircraft, and the relative size of the aircraft being used.

Increased efficiency

It is generally accepted that deregulation leads to increased competition which provides a catalyst for greater efficiency, which in turn leads to lower costs and prices for consumers (Johnston & Trembath 2005, Noam 1993). Thus, in an effort to maintain profitability, the industry aims to maximize efficiency in profitable market segments. The success of deregulation in this case is concentrated on high to medium density regional air routes (BITRE 2008). In these cases, the first dimension of efficiency is the reduction in costs and prices to consumers.

It should be noted that this efficiency dimension does not apply to all regional routes. Johnston and Trembath (2005) argue that certain regional air routes do not support the competitive entry model. The introduction of competition to these vulnerable routes could have a destabilizing effect, which may lead to the failure of the incumbent, its competitors or both. This may lead to the withdrawal of the service. TFI and CAPA (2004), argues that while an open market may encourage new market entrants, on some vulnerable regional routes, the competition could not be sustained. Although this may leave the most efficient, or financially supported operator, the resulting lack of competition may discourage this operator to remain efficient over time (Johnston & Trembath 2005).

The second dimension of efficiency is the rationalization of aircraft size and market size. For example, in Australia, a regional airline (Regional Express) partnered with the authorities of a regional port (Burnie City Council and Burnie Airport Corporation). This partnership allowed Regional Express to improve frequency and the schedule between that Burnie and a major capital city (Melbourne). "In the same

year, Regional Express embarked on a large fleet modernisation and expansion program involving a long-term lease of 25 latest generation Saab 340B, plus aircraft from Saab Aircraft Leasing over the three years. The improvement in service quality and the increase of cost efficiency by using appropriate aircraft make economically self-supporting air services possible” (BITRE 2008, pg181).

Increased innovation

There are two important dimensions of innovation which governments appear to encourage; technology, and product offering. The first dimension, technological innovation can then be divided into two aspects. The first aspect of technological innovation is measured by the resulting technological improvements which benefit consumers. Through an increase in competition, operators may consider improving service offerings with improved technological services such as electronic booking systems, improved check-in systems or in-flight entertainment. The second aspect of technological innovation is a measure of integration which the industry generates. In a flourishing aviation industry with access to innovative ideas, government commitment, appropriate taxation policies and access to skilled labor markets, technological integration can assist in deregulation strategies (Moxon 1987, Goldstein 2002).

The second dimension of innovation is related to market segmentation and is also linked to competitive behavior. This dimension is a measure of innovative solutions and product offerings that operators achieve in order to compete in a market driven industry. Some examples include innovative loyalty programs or classes of airfares.

CONCLUSION

This paper has examined Australia, Brazil and Canada as case studies, considering each country's deregulation process applicable to the regional aviation sector. Each has been examined in terms of government objectives and outcomes. While each government has been motivated towards a model of deregulation by a variety of factors, each country's experience, - post-deregulation, – is still heavily debated.

Never-the-less, the investigation of economic regulatory reforms, combined with a review of the current status of regional aviation within these three countries has provided a platform for the development of four broad criteria to determine the impact of government economic policy on regional aviation. These are; 1) improved service quality, 2) increased competition, 3) increased efficiency, and 4) increased innovation. It is hoped that with further development, these four emerging criteria identified in this paper, provide a succinct and clear model in post-deregulation assessment processes, particularly focused on the impact of deregulation on regional aviation.

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