AN ECONOMETRIC ANALYSIS OF THE CANADA - FLORIDA AIR PASSENGER MARKET

by

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This thesis was prepared under the direction of the candidate's thesis committee chairman, Dr. Abe Harraf, Department of Aviation Business Administration, and has been approved by the Thesis Review Committee. It was submitted to the Office of Graduate Programs and was accepted in partial fulfillment of the requirements for the degree of Master of Business Administration in Aviation.

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ABSTRACT

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This thesis evaluates the Canada - Florida commercial air passenger market and explains fluctuations in the demand for air passenger service based on an econometric modeling process. Canada - Florida commercial air passenger traffic is segmented into those passengers flying on scheduled air services and those travelling on chartered air services. Two separate multiple regression equations are constructed to address the two segments of the Canada - Florida market. Both equations are formulated utilizing the same three independent variables. It was expected that the three chosen independent variables, Canadian GDP, a ratio of chartered air fare levels by scheduled air fare levels, and a ratio of chartered flight time by scheduled flight time, would explain the changes exhibited in air passenger enplanements and deplanements within the Canada - Florida air passenger market between 1971 and 1992. The results of the two separate multiple regression equations partially substantiated the hypothesis. The equation corresponding to chartered enplanements and deplanements proved to be highly significant while the equation corresponding to scheduled enplanements and deplanements was not as robust as the researcher anticipated.

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Chapter One
INTRODUCTION

Research Objectives

The primary objective of this thesis is to explain changes in the demand for scheduled and chartered air service within the Canada - Florida air passenger market. An econometric modeling process is used to evaluate and explain trends in the development of this commercial air passenger market. Two separate multiple regression equations will be used to evaluate fluctuations in the demand for chartered and scheduled air service. The econometric models will gauge the influence of economic factors and service related factors upon the demand for commercial air service between Canada and Florida.

The Canada - Florida market was selected for this study due to its dynamic nature. This market has experienced large periodic cycles of growth. Growth in some of the city pairs within this market at times appears to be exponential, while other city pairs' growth resembles a laggardly incremental rate of increase.

This research will also qualitatively analyze the distinction between scheduled and chartered air services within the Canada - Florida market. Changes within each of these market segments will be examined to determine how they have impacted the development of the overall Canada - Florida commercial air passenger market.

Literature Review[1]

First, a basic understanding of size and mechanics of the Canada - Florida air passenger market is necessary. Alexander[2] describes the US - Canada air market as America's largest international air travel market, outdistancing the second largest market, the UK, by nearly 30 percent. He indicates that about 13 million passengers fly between Canada and the United States each year. He goes further to state that US airlines carry about two-thirds of the 11 million passengers on scheduled services, and Canadian airlines carry almost all of the 2 million charter or nonscheduled passengers.

Information written in a report by Ouimet[3] concurs with the above mentioned information and goes further to state that approximately 60% of transborder journeys begin in Canada. He also clarifies that charter services are provided mainly to US leisure destinations such as Florida, Nevada, and Hawaii and that Canadian carriers dominate the smaller charter market, carrying 96% of the 2.4 million passengers in 1989.

There appears to be further evidence indicating that the Canadian carriers' dominance of the charter market is increasing. A statistical abstract compiled by Statistics Canada[4] indicates that in 1991 Canadian air carriers carried 97.2% of charter transborder traffic. The study states that the Canada - Florida charter market for 1991 represented 28% of all Canadian international charter flights.

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[1] Only the most relevant references were included in the review of the literature section. Please consult the bibliography for a more thorough listing of references consulted.

[2] Albert N. Alexander, **"U.S. - Canadian Aviation Negotiators Seek 'Open Skies',"** **Business America** 27 (January 1992): 7.

[3] Paul G. Ouimet, **Canada - U.S. Air Industry: Debating "Open Skies"**, (Vancouver, Canada: Western Transportation Advisory Council, 1991), 1.

[4] Statistics Canada, **Air Charter Statistics**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1992), 22.

Another publication by Statistics Canada[5] documented how Canadian charter air services grew. The study indicates that during the 1960s and 1970s there were stringent regulations governing the purchase of tickets on charter flights. Those on a charter had to be members of a club or a group for a period of at least six months prior to flight departure. However, in late 1972 the regulations were changed with the introduction of advanced booking charters. These charters used a minimum pre-booking deadline and a minimum stay provision, instead of the aforementioned affinity concept, to prevent diversion of traffic from scheduled to chartered services. The publication indicates that between 1970 and 1975 charter service between Canada and the US increased almost 400 percent. Chartered air traffic between Canada and Florida during the same time period increased 620 percent.[6]

By 1992, air passenger traffic between Canada and Florida was evenly split between scheduled and chartered air services. According to Statistics Canada,[7] seven of the top twenty-five scheduled city-pairs included the state of Florida. Toronto - Miami was the sixth largest market in terms of number of passengers carried. Toronto - Tampa was the seventh largest and Montréal - Miami was the tenth largest market.

To understand the mechanics of the Canada - Florida air passenger market it is first necessary to understand the Canada - US bilateral air service agreement. Ouimet[8] points out that the Canada - US bilateral air service

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[5] Statistics Canada, **Aviation in Canada**, (Ottawa, Canada: Minister of Supply and Services Canada, 1986).

[6] Statistics Canada, **Air Charter Statistics**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1992).

[7] Statistics Canada, **Air Passenger Origin and Destination, Canada - United States Report**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1993), 8.

[8] Paul G. Ouimet, **Canada - U.S. Air Industry: Debating "Open Skies"**, (Vancouver, Canada: Western Transportation Advisory Council, 1991).

agreement is made up of five separate major agreements including: (1) Air Transport Agreement (1966, amended in 1974) which contains principles and rules for regulation of scheduled transborder air services; (2) All-Cargo Notes (1966) which cover scheduled cargo services; (3) Nonscheduled Services Agreement (1974) pertaining to transborder charter operations; (4) Pre-clearance Agreement (1974) which permits Customs and Immigration officials from one country to pre-clear passengers boarding transborder flights at specified airports in the other country; and (5) Regional, Local, and Commuter Services Agreement (1984) which gives each country the right to approve commuter services for city-pairs not included in the Air Transport Agreement. Several, but not all, of these agreements pertain to commercial air passenger service between Canada and Florida.

The Air Transport Agreement (1966)[9] and the amendment to the Air Transport Agreement (1974)[10] combined indicate the total number of city-pair markets between Canada and the US which are designated for nonstop transborder air service. However, not all of the designated transborder city-pairs are served by the airlines.

Critics such as Beynon[11] state that all transborder air services are strictly controlled and limited by the severely dated Canada - US air bilateral signed in 1974 and that today's global economy bears little resemblance to that of 1974.

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[9] Secretary of State, **Canada Air Transport Services (1966)**, vol. 17, **United States Treaties and Other International Agreements**, (Washington, D.C.: Government Printing Office, 1966).

[10] Secretary of State, **Canada Air Transport Services Amendment (1974)**, vol. 25, **United States Treaties and Other International Agreements**, (Washington, D.C.: Government Printing Office, 1975).

[11] Rob Beynon, **"Stalled Open Skies Talks Threaten Vancouver's Pacific Rim Strategy,"** **Sounding Board** (May 1993).

He goes on further to indicate that the limitations imposed by the Air Transport Agreement (1974) are frustrating our communities' economic and social development initiatives.

Alexander[12] concurs stating that the existing bilateral aviation regime, which has not been amended substantially since 1974, currently limits the number of carriers and flights for both scheduled and chartered service. Consequently, many US communities and air carriers that want to add Canadian points to their route systems are frustrated by the lack of provision for them. He cites an example indicating that only 35 US cities out of more than 100 hubs are permitted to have nonstop service to Canadian destinations. He continues by indicating that the present restrictive air service regime has meant that air travel between the two countries has grown at a far lower rate than its potential. Historical data show that US - Canada air travel grew by only 15% during the 1980s, compared to 63% for the US international air market overall. He concludes that if air transportation had grown twice as fast between 1980 and 1989 as trade (the normal pattern), then communities on both sides of the border would have had a total of $9.3 billion more economic activity in 1989.

Critics point out that transborder air service has not kept pace with growing economic and social ties between Canada and the US. Changing demographics and new tourist destinations have increased demand for air services to certain cities. In Florida chartered air services have capitalized on the restrictive nature of the Air Transport Agreement (1966, 1974) as the demand for air services to new tourist destinations has grown. Orlando and Ft. Myers are examples where charter air services have experienced tremendous growth. Scheduled air services' growth to these cities has not been as great

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[12] Albert N. Alexander, **"U.S. - Canadian Aviation Negotiators Seek 'Open Skies',"** **Business America** 27(January 1992): 7.

primarily due to restrictions precluding scheduled nonstop flights to these cities. In attempting to assess the demand for air passenger service between Canada and Florida it is important to consider all aspects that potentially affect demand including regulatory factors, economic factors, and service related factors.

Structure of Research

The basic structure of this research will flow around the development of the regression equations that will attempt to explain historical passenger enplanement and deplanement trends in the Canada - Florida air passenger market. Within the aviation field, the most common form of econometric model utilized for evaluation purposes is the regression analysis. A variation of this model, the multiple regression analysis, will be used to examine commercial air passenger demand. The underlying principle is that the demand for commercial air passenger service is related to and affected by one or more economic, social, or supply factors.[13] The progression of subsequent chapters contained within this work will revolve around the steps needed to develop the model. The simple flow chart shown on the following page in figure 1 illustrates the regression model development process. Each necessary step that must be taken to formulate a regression model corresponds to a chapter within this research.

The body of this thesis begins with the second chapter. This chapter corresponds to the first step in developing a regression equation that explains and evaluates changes in air passenger traffic. The first step is to review past data and to determine significant trends. An in-depth study of the Canada -

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[13] Rigas Doganis, **Flying Off Course: The Economics of International Airlines**, 2nd ed., (New York: Harper Collins Academic, 1991; reprint, New York: Routledge, 1992), 245.

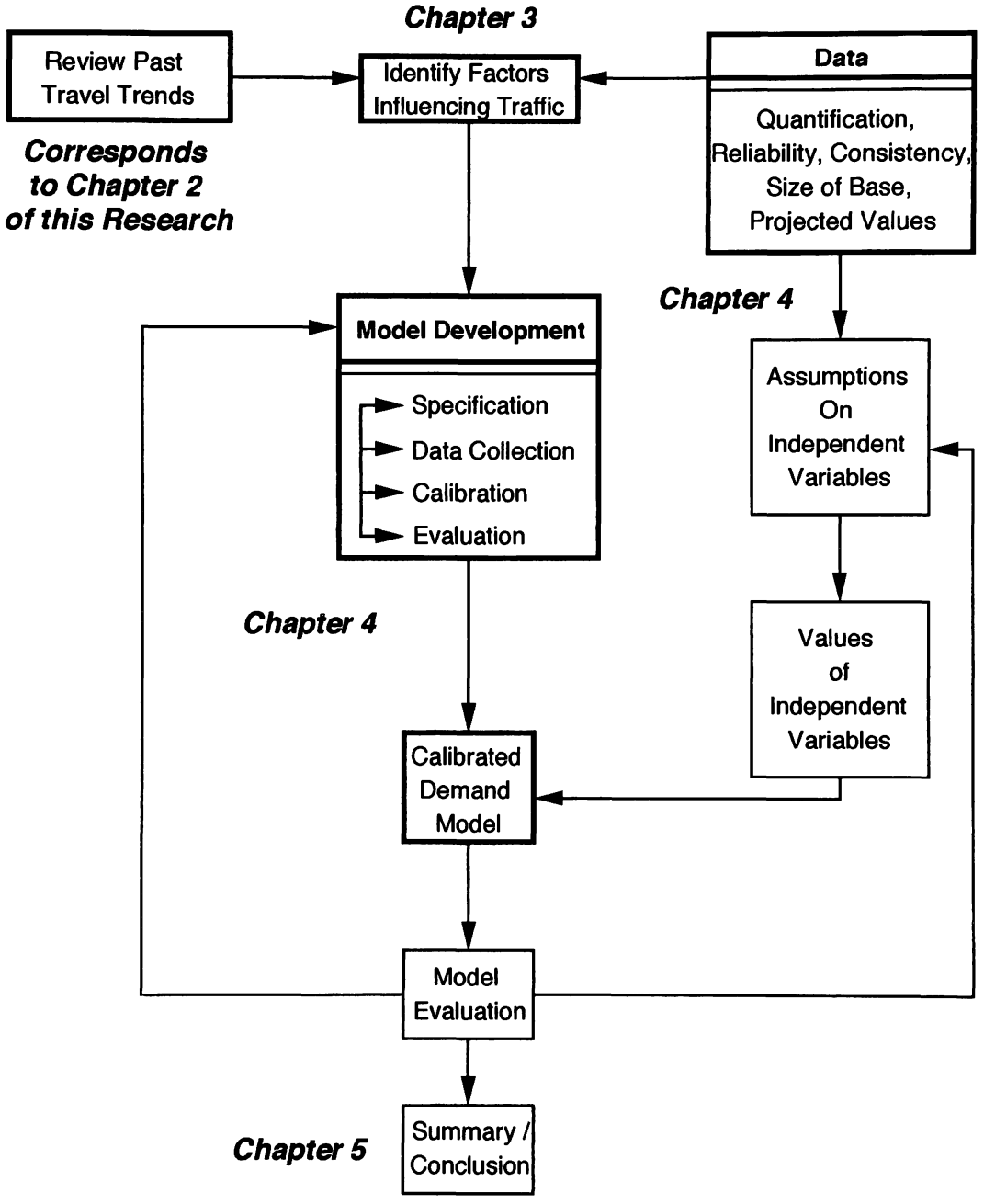

Figure 1. **Regression Model Development**

Source: *Airline Traffic Forecasting: A Regression Analysis Approach*

Florida commercial air passenger market will be presented. The market will be segmented on the basis of the following: type of service, scheduled or chartered air passenger service; point of origin; and point of destination.

The third chapter deals with identifying factors which influence traffic. This step involves the identification of economic factors, service-related factors, and other factors which have influenced the development of air traffic in the past and that will exert influence in the future. This chapter will expose potential independent variables for the regression equations. The regulation of international air service by governmental treaties or bilateral air service agreements will be closely examined to reveal how the Canada - Florida market has been affected and influenced by external regulations.

The next step is the development of the econometric equations, and this is contained in the fourth chapter. Independent or explanatory variables must be selected from the factors which have influenced traffic development. The ordinary least-squares estimation procedure is employed to determine the closest fit of the computed demand to the actual demand. The last step in the modeling process is to evaluate how well the model explains the changes in enplanements and deplanements on the Canada - Florida air passenger market.

The fifth chapter is a summary of the findings and conclusions obtained from this research. Also, recommendations will be provided for parties interested in conducting further research pertaining to the Canada - Florida commercial air passenger market.

Also, this chapter discusses a future variable that has the potential to exert tremendous influence over the Canada - Florida market. This potential factor is the proposed "Open Skies" agreement which is currently in a governmental state of limbo due to differences in the Canadian and American stance on the

alteration of the bilateral air service agreement. While the information regarding the potential "Open Skies" agreement is not directly related to the development of the models contained within this research, it is nonetheless crucial to the future task of evaluating and forecasting demand and summarily holds significance for further research in this area.

Hypothesis

The hypothesis of this research is as follows:

H_O: Changes in the demand for **(A)** chartered and **(B)** scheduled air service between Canada and Florida from 1971 to 1992 can be explained by a combination of factors including Canadian Gross Domestic Product, a ratio of chartered air fare divided by scheduled air fare, and a ratio of chartered flight time divided by scheduled flight time.

The alternative to this hypothesis is that:

H_A: Changes in the demand for **(A)** chartered and **(B)** scheduled air service between Canada and Florida from 1971 to 1992 can not be explained by a combination of factors including Canadian GDP, a ratio of air fares, and a ratio of flight times.

Chapter Two

TRENDS IN THE CANADA - FLORIDA AIR PASSENGER MARKET

Examination of the Market

This research focuses upon the flow of international air passengers between Canada and the US state of Florida. However, prior to examining this market, the overall Canada - US air passenger market will be briefly evaluated. This examination will attempt to expose the relevancy and importance behind the researcher's selection of the Canada - Florida air passenger market as the basis for this research.

First, it should be noted that air travel between Canada and the United States represents the largest transborder air passenger market in the world.[14] In 1989, more than 13 million passengers flew between the two countries, up from 8.9 million in 1978. Approximately 60% of these individuals originated in Canada. Passengers paid more than $2.3 billion in fares in 1989, and this barely scratches the surface of the tremendous economic relationship underlying the exchange of air passengers between the two countries.

Figure 2 graphically demonstrates the relevant importance of Canadian air passengers traveling to the US. Canadian international air passengers represented 26% of all foreign air travelers entering the US in 1992. Canada

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[14] Paul G. Ouimet, **Canada - U.S. Air Industry: Debating "Open Skies"**, (Vancouver, Canada: Western Transportation Advisory Council, 1991), 1.

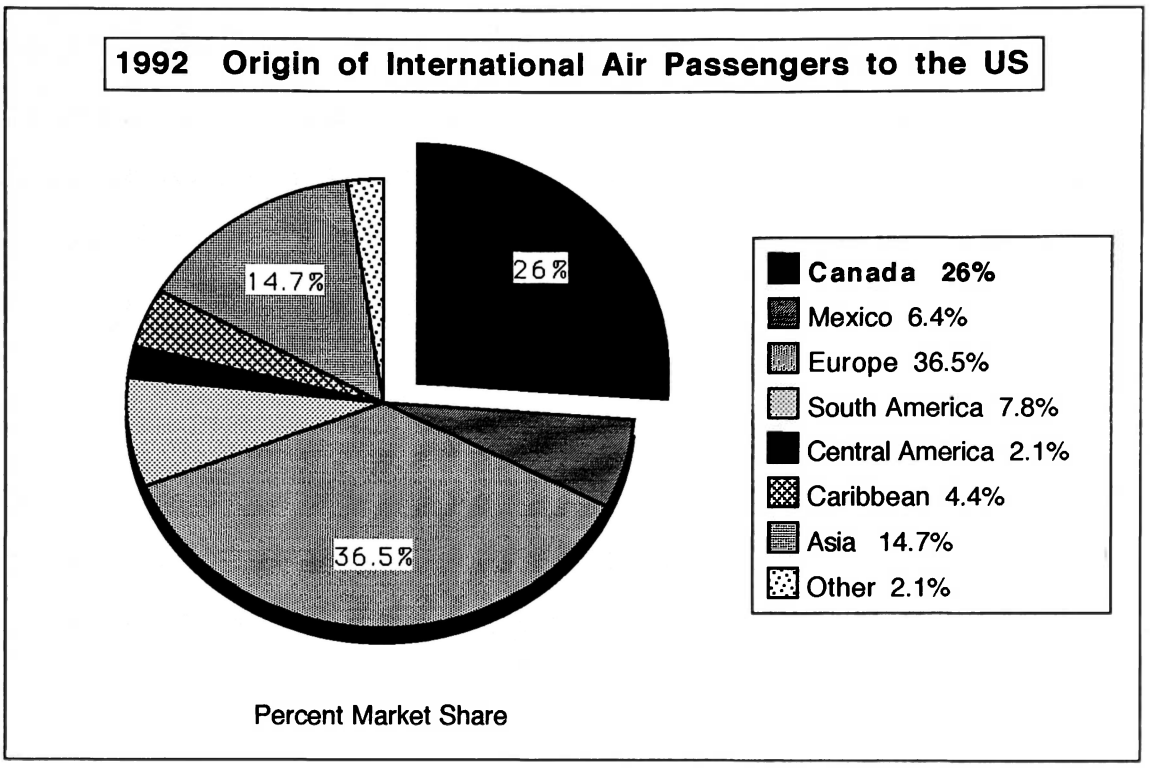

Figure 2. **1992 Breakdown of International Air Passengers to the US**
Sources: USTTA, *Summary and Analysis of International Travel to the US*; Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

represents the largest single contributor of international passengers. Although the European region overall represents more international arriving air passengers to the US, 36.5% to be exact, this percentage is comprised of international air passengers from more than 20 different countries. All other segments of figure 2, excluding Mexico, represent regions rather than individual countries. This clarification only further highlights the importance of Canadian international air travellers to the US.

Figure 3 illustrates the significance of Canada - Florida air traffic to the overall Canada - US market. Figure 3 is a graphical representation of the US points of origin or destination of air passengers who flew between Canada and

the US in 1992. It should be pointed out that this graph represents all transborder air passengers including those that flew on chartered air services as well as those who flew scheduled flights.

As the graph indicates, the state of Florida is by far the largest recipient of international air passengers flying between Canada and the US. Over 25% of transborder traffic originates or is destined for the state of Florida. The next closest state, California, is more than 10 percentage points lower than Florida in transborder traffic. Approximately 72% of transborder air passengers originate or are destined for primarily 7 US states including: California, Florida, Illinois, Massachusetts, Nevada, New York, and Texas. The remaining 28% of the traffic is between Canada and other states throughout the US.

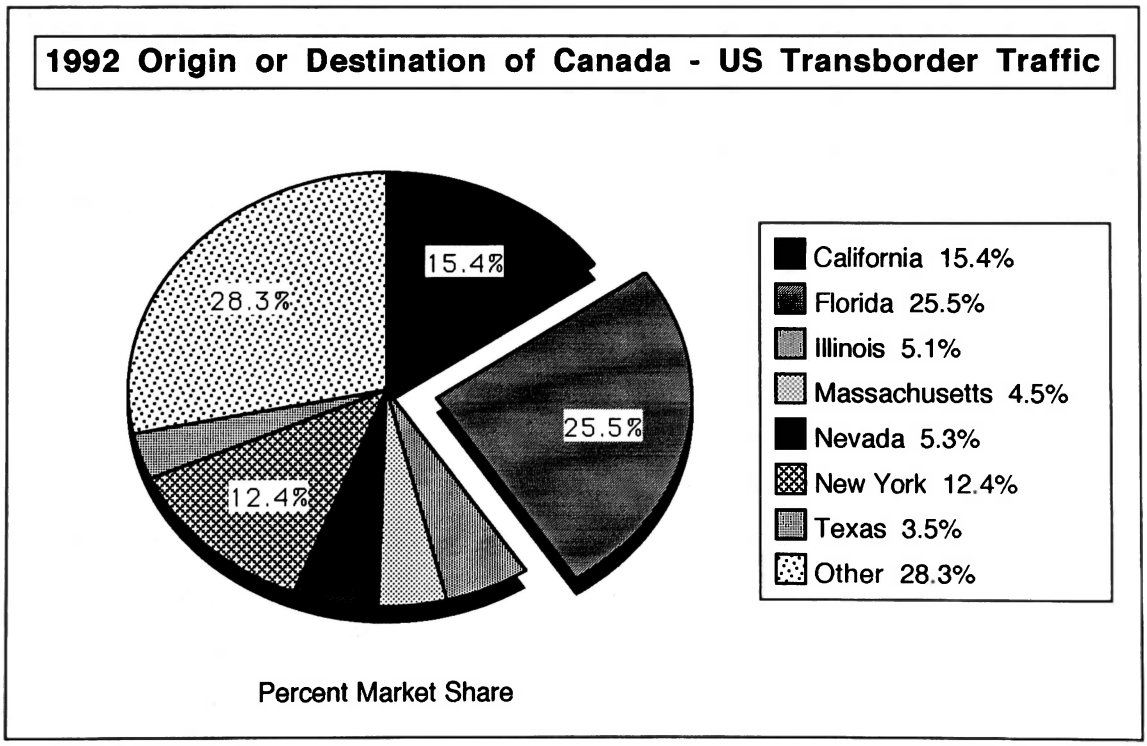

Figure 3. **US State of Origin or Destination of Transborder Air Traffic**
Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

While figure 3 does not show the segmentation of the market into chartered and scheduled air services, it should be noted that in 1992 Florida garnered 16% of scheduled[15] and 66% of chartered[16] transborder traffic. California had a slightly higher percentage of scheduled transborder air passengers with 18.2%. Florida was next in scheduled air passengers followed by New York with 15.3%. No other state accumulated more than 6% of the scheduled transborder traffic.

Florida by far represented the number one chartered transborder destination. Nevada was the only other state to garner a sizeable amount of chartered air passenger traffic with 22%. These two states combined accounted for 88% of the chartered transborder market. Other vacation destinations such as California, Hawaii, and Arizona had portions of the remaining chartered transborder traffic.

A closer examination of the market reveals that an overwhelming majority of the commercial air passenger traffic present in the Canada - Florida air corridor originates in Canada. Canada 3000 and Canadian Holidays', two charter air service operators contacted by the researcher, indicated that between 90% - 95% of their passenger traffic originates in Canada. Also, the majority of passengers on scheduled service originate in Canada as well. Air passengers flying between Canada and Florida are primarily leisure travellers. Traffic in this market is seasonal, with the peak of the travel season coinciding with the coldest Canadian months during the winter.

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[15] Statistics Canada, **Air Passenger Origin and Destination, Canada - United States Report**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1993).

[16] Statistics Canada, **Air Charter Statistics**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1992).

Figure 4 is a map of the nation of Canada. Canada is geographically the second largest country in the world. However, in terms of population it is quite small. In 1992 the total population of Canada was approximately 27 million people. Canada consists of 10 provinces and 2 national territories, and many Canadians affectionately refer to Florida as the 11th Canadian province.[17]

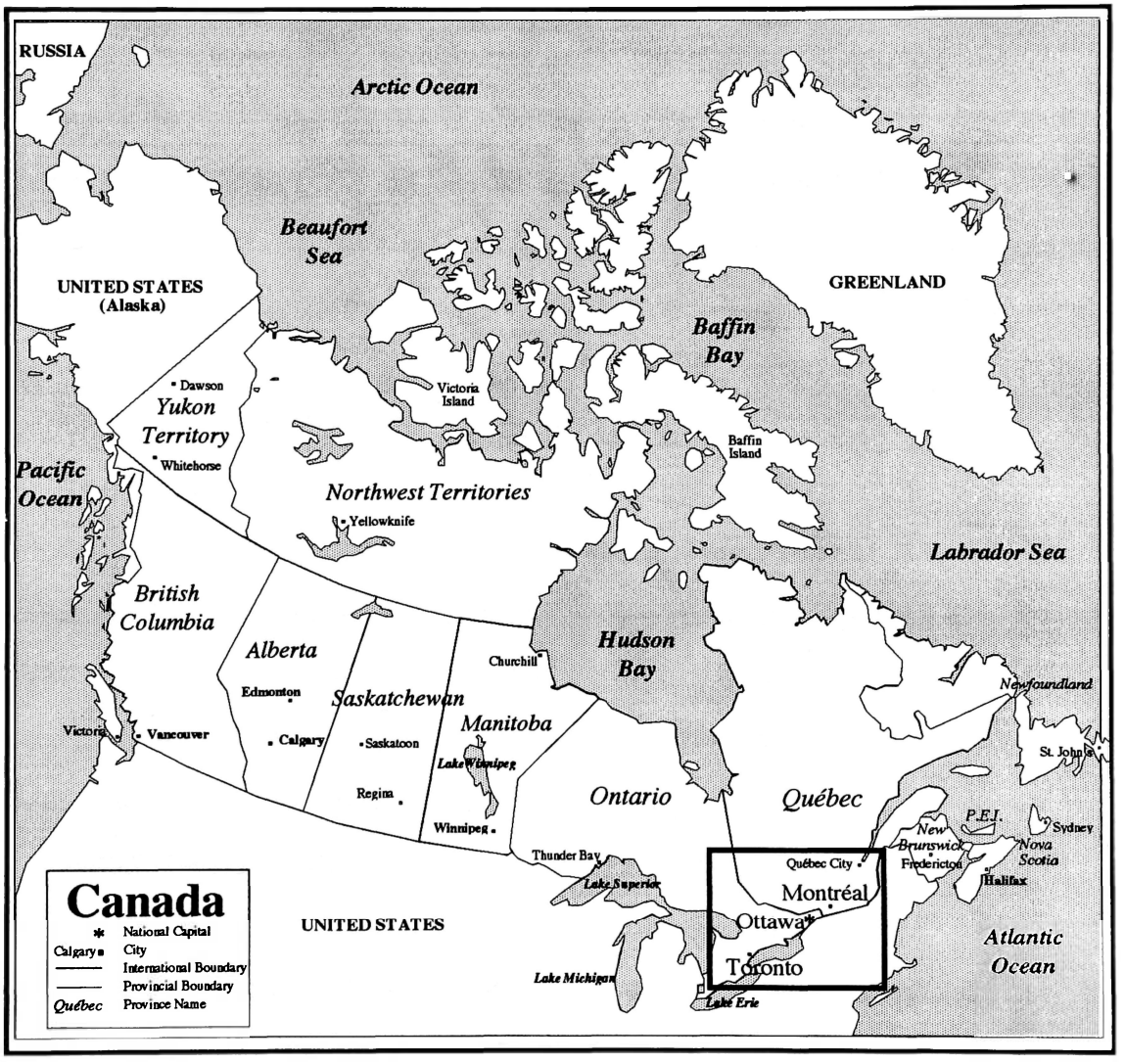

Figure 4. **Map of Canada**

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[17] Bureau of International Tourism, **Florida Department of Commerce, Division of Tourism 1993 - 94 Marketing Plan**, (Tallahassee, Florida: Florida Department of Commerce, Bureau of International Tourism, 1992), 52.

Over 85% of Canada's population lives within 200 miles of the Canada - US border.[18] Approximately 56% of the Canadian population resides within the two eastern provinces of Ontario and Québec. The population of Canada is concentrated in several key urbanized areas.

Canada's unique demographic characteristics have affected the way in which air passenger traffic between the US and Canada has developed. US air carriers transport the majority of scheduled passengers between the two nations since they have access to most of the Canadian market through several key cities. US air carriers possess an advantage over their Canadian counterparts since they can fly Canadian air passengers to cities throughout the US while Canadian airlines can serve only a limited number of US cities.

Examination of Time-Series Data from 1971 - 1992

The first step in developing a multiple regression model is to examine historical time-series data relevant to the market being studied. This examination process reveals important trends which have impacted the development of the air passenger market. As indicated earlier, 22 years of times-series data (1971 - 1992) concerning the Canada - Florida commercial air passenger market are analyzed within this study.

Within the regression model, the Canada - Florida air passenger market will be evaluated as one cohesive market. However, the time-series data obtained allows the possibility to qualitatively examine the development of eleven Canada - Florida markets. Figure 5 is a visual depiction of the eleven Floridian destinations analyzed within this research. These markets are not city-pairs, rather they are representations of passengers flying between

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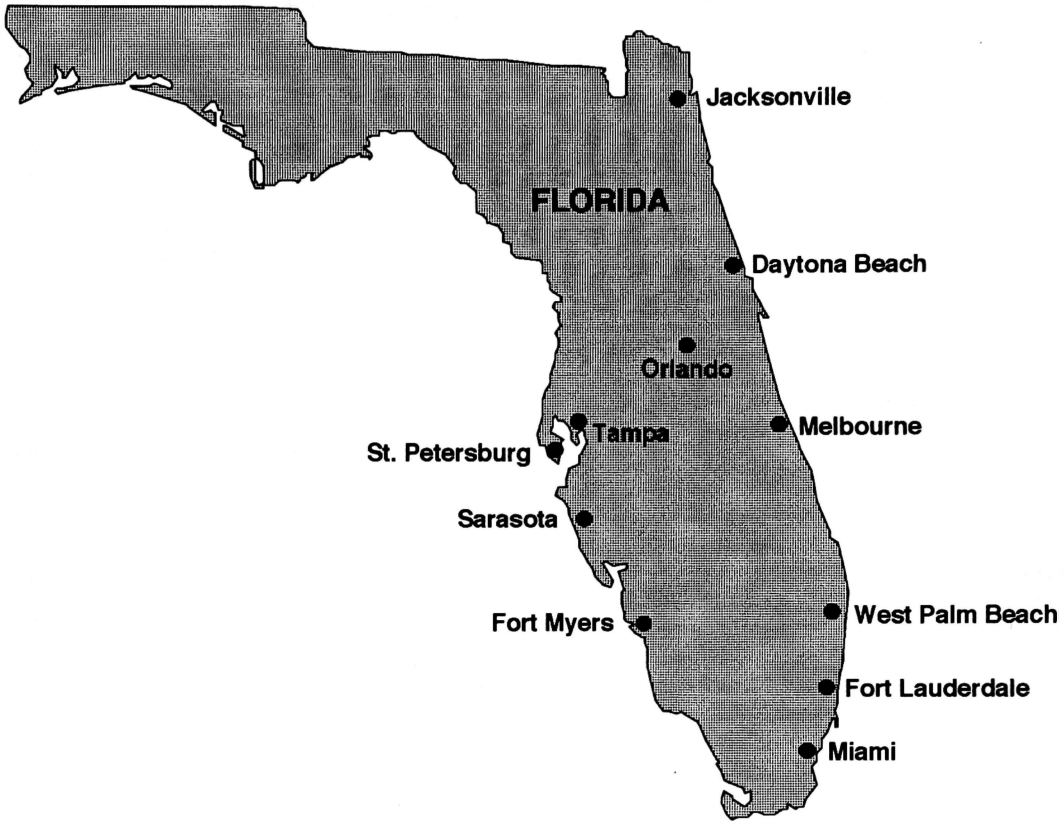
[18] Ibid.

Figure 5. **Geographic Location of Markets Analyzed**



points in Canada to specific cities in Florida such as Canada - Miami or Canada - Tampa.

First, the entire Canada - Florida air passenger market will be examined. Table 1 and Figure 6 illustrate the change in the Canada - Florida market for the 22 years spanning from 1971 to 1992. Table 1 on the following page shows the breakdown of air passengers travelling on scheduled services on the left and on the right data concerning chartered air services are exhibited. Figure 6 is a graphical representation of the information contained within Table 1.

The most apparent change in this marketplace is the tremendous growth of traffic from 1971 to 1992. Total enplanements and deplanements in 1971 within the Canada - Florida air passenger market were 388,022, and by 1992 the

Table 1. **Annual Canada - Florida Enplanements and Deplanements**

CANADA - FLORIDA AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	184,860	178,555	363,415	12,437	12,170	24,607	388,022
1972	244,180	233,455	477,635	24,523	23,412	47,935	525,570
1973	285,235	273,595	558,830	40,122	38,522	78,644	637,474
1974	345,020	329,260	674,280	59,594	56,394	115,988	790,268
1975	373,630	357,810	731,440	90,332	86,818	177,150	908,590
1976	458,260	438,600	896,860	126,247	123,645	249,892	1,146,752
1977	510,560	484,260	994,820	192,565	187,627	380,192	1,375,012
1978	561,880	542,050	1,103,930	236,575	230,728	467,303	1,571,233
1979	646,420	635,870	1,282,290	251,809	245,541	497,350	1,779,640
1980	677,540	663,530	1,341,070	312,507	303,537	616,044	1,957,114
1981	657,890	645,270	1,303,160	385,866	367,672	753,538	2,056,698
1982	651,450	641,760	1,293,210	386,953	399,388	786,341	2,079,551
1983	541,340	535,250	1,076,590	384,946	376,344	761,290	1,837,880
1984	571,110	567,290	1,138,400	385,549	394,172	779,721	1,918,121
1985	506,700	504,670	1,011,370	413,773	418,205	831,978	1,843,348
1986	515,980	515,280	1,031,260	406,463	409,298	815,761	1,847,021
1987	538,590	527,780	1,066,370	436,931	429,646	866,577	1,932,947
1988	545,910	537,430	1,083,340	538,799	543,732	1,082,531	2,165,871
1989	583,940	576,960	1,160,900	682,961	700,181	1,383,142	2,544,042
1990	687,190	683,620	1,370,810	693,206	698,537	1,391,743	2,762,553
1991	638,490	631,020	1,269,510	607,091	618,656	1,225,747	2,495,257
1992	689,240	677,640	1,366,880	664,766	671,866	1,336,632	2,703,512

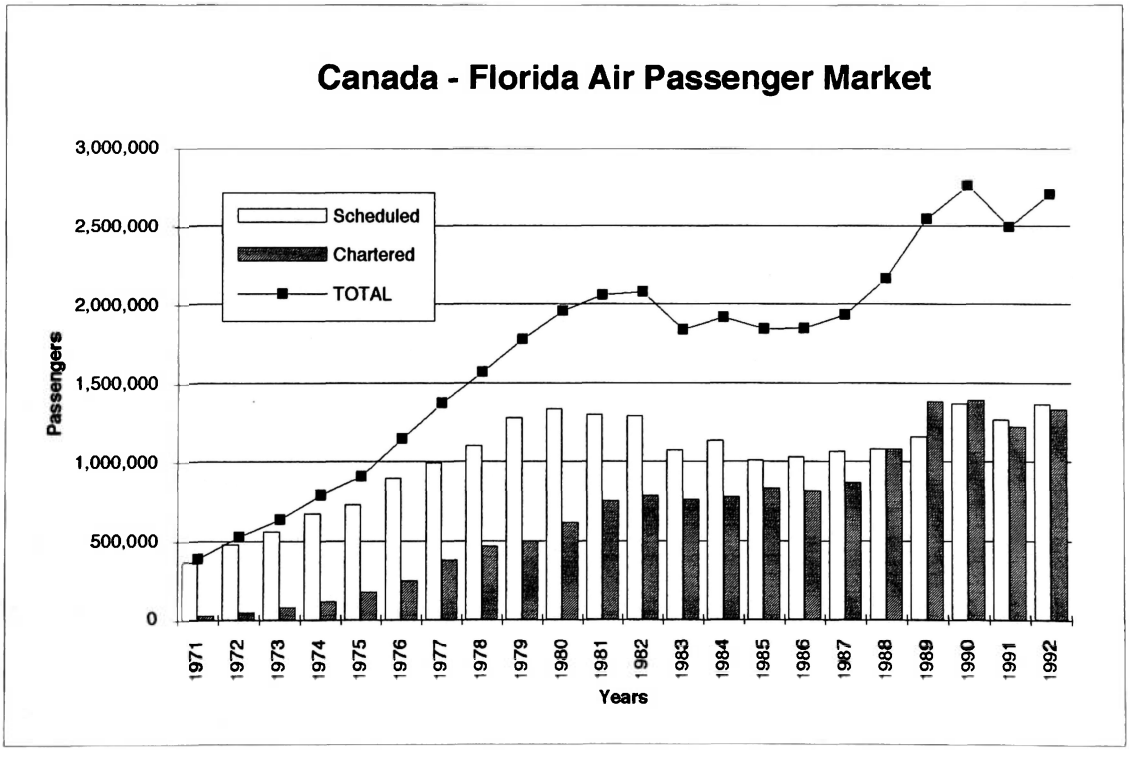


Figure 6. **Graphical Representation of Annual Canada - Florida Enplanements and Deplanements**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

traffic had increased to 2,703,512. The absolute increase of 2,315,490 enplanements and deplanements from 1971 to 1992 represents a 597% increase in 22 years.

Looking at the annual changes in enplanements and deplanements reveals that from 1971 to 1980 the market grew at an annual double digit rate. The range of increase during this time frame extended from a high of 35.4% annual increase between 1971 and 1972 to a low of 10% annual increase between 1979 and 1980. In general, the highest annual increase in enplanements and deplanements in the Canada - Florida air passenger market occurred in the early 1970s and gradually tapered down by 1980.

Growth began to slow in the 1980s with single digit annual percentage increases, and between 1982 and 1983 the market experienced a contraction of 11.6%. Growth between 1983 and 1987 in the Canada - Florida air passenger market was relatively flat. The market would experience a small increase one year only to be offset by a decrease the following year. Enplanements and deplanements in 1987 were lower than the 1980 totals. The 1970s appeared to be the decade of phenomenal growth for the Canada - Florida air passenger market, while the 1980s saw traffic levels fall.

However, by the end of the 1980s the Canada - Florida market would rebound and return to strong growth. Between 1987 and 1988 passenger enplanements and deplanements grew 12.1% followed by a 17.5% annual increase between 1988 and 1989. This growth came primarily from increases in passengers carried by chartered air services.

Although growth steadily increased up to 1990, the early 1990s lacked consistent sustainable growth. Between 1990 and 1991 enplanements and deplanements fell 11.9%. The following year the market rebounded and the annual change in enplanements and deplanements increased 8.3%. This

effectively left the market above its 1989 position but below its highest point in 1990.

When examining the Canada - Florida air passenger market in regards to the market's development from 1971 to 1992, there are primarily three ways the market can be divided and analyzed. First, the traffic in the market can be segmented into passengers carried by scheduled air services and those carried by chartered air services. Second, since the traffic is highly directional with the majority originating in Canada and destined for Florida, the various points of origin in Canada can be evaluated. Third, the market can be segmented on the basis of point of destination in Florida. Examining the development and change of the market based on these three segments may allow greater insight as to how and why the market has changed the way it has.

The most notable characteristic of the Canada - Florida air passenger market is the segmentation of the market into traffic carried via scheduled and chartered air services. Generally, scheduled air service is characterized as following a routine frequency of service which is fixed or set for a long-term amount of time, usually several months to a year in advance. Chartered air service typically is considered to be less routine in frequency, often it may be seasonal, operating only a few months of the year. Chartered flights may be cancelled more easily than scheduled flights if traffic is insufficient to warrant service. Chartered air service is viewed as being more flexible from the perspective of the air service operator. More often chartered air services are designed to meet the needs of leisure travellers by operating seasonally when travellers would like to vacation. They provide an acceptable level of service at an economical fare, and flexibly serve destinations that appeal to leisure travellers which may not be served conveniently by scheduled services.

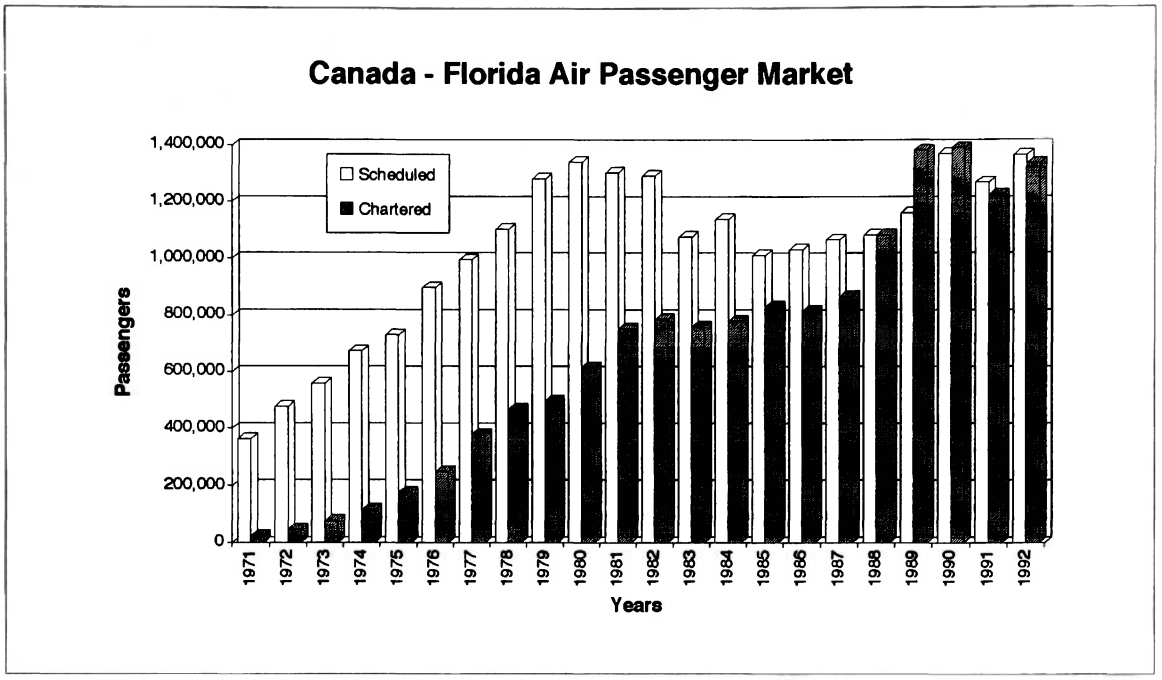


Figure 7. **Segmentation of Scheduled and Chartered Air Services**
Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics.*

Figure 7 is a more precise breakdown of scheduled and chartered air services within the Canada - Florida air passenger market. This graph illustrates the tremendous growth in traffic carried by chartered air services from 1971 to 1992. By simply looking at figure 7 it is quite apparent that between 1971 and 1992 traffic carried on chartered air services grew at a faster rate than did traffic carried by scheduled services. During this time frame the average annual growth rate of scheduled air services was 6.8%, while the average annual rate of growth for chartered air services was 22.4%.

A natural assumption might be to state that chartered air services siphoned traffic away from scheduled air services. However, there is not enough information present in figure 7 to fully support this assumption. Yet, by looking

at specific Canada - Florida markets it is possible to determine that chartered air services have taken traffic away from scheduled services in certain markets.

The Canada - Ft. Lauderdale air passenger market adequately demonstrates that after 1980 scheduled air services lost market share or passenger traffic to chartered air services as the overall Canada - Ft. Lauderdale air passenger market grew. (Refer to appendix A page 61.) Between 1980 and 1992 scheduled air passenger enplanements and deplanements decreased by 49%, while chartered air passenger traffic increased 426%. The important factor to notice is that while passenger traffic on the market rose, scheduled traffic continued to fall. This confirms that some of the passengers switched from scheduled air services to chartered air services in certain Canada - Florida air passenger markets.

Another way to evaluate the development of the Canada - Florida air passenger market is to examine the origin of passengers in Canada from 1971 to 1992. Table 2 depicts the changes in origination of passengers in the Canada - Florida air passenger market. The table summarizes changes which have taken place in five year intervals spanning from 1972 to 1992.

The most obvious characteristic of the Canada - Florida air passenger market concerning point of origin is the high concentration of origins in the two largest metropolitan areas in Canada. In 1972 approximately 84% of the Canada - Florida air passenger market originated or was destined for Toronto and Montréal. By 1992 the two cities accounted for roughly 77% of the market. Over the span of 20 years the two cities relative market share of the overall Canada - Florida market was reduced by 7%. To be more specific, Montréal's relative market share decreased 9.5% while Toronto's grew 2.9%.

Montréal and the "other" category which represents all other cities in Canada not expressly mentioned were the only two categories to lose relative

Table 2. **Comparison of Historical Canadian City Market Share**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Canadian Origin Point of Florida Bound Traffic Scheduled and Chartered Air Services Combined					
City	**1972**	**1977**	**1982**	**1987**	**1992**
Calgary	0.7%	0.8%	1.0%	1.9%	2.0%
Edmonton	0.5%	0.8%	0.9%	0.9%	1.7%
Halifax	1.3%	2.1%	2.0%	2.1%	2.1%
Montréal	**38.2%**	**36.6%**	**36.1%**	**32.4%**	**28.7%**
Ottawa	3.8%	3.9%	3.5%	3.4%	4.2%
Quebéc	1.7%	1.6%	3.4%	2.2%	3.6%
Toronto	**45.7%**	**45.6%**	**44.4%**	**49.8%**	**48.6%**
Vancouver	1.2%	1.2%	1.2%	1.5%	2.5%
Winnipeg	1.5%	1.9%	2.2%	2.0%	2.2%
Other	5.4%	5.5%	5.3%	3.8%	4.4%
	100%	100%	100%	100%	100%

market share. Cities in western Canada were the largest gainers. Vancouver, Winnipeg, Calgary, and Edmonton gained a collective 4.5% in market share. These cities represent growth markets for the Canada - Florida air passenger market.

However, figure 8 indicates that the most important Canadian cities representing points of origination or destination are by far Toronto, Montréal, and the region that lies between the mouth of the St. Lawrence River and the Ontario Peninsula. The cities of Toronto, Montréal, Ottawa, and Québec City are within this region. These four markets in 1992 represented the origin or destination point of approximately 85% of passengers flying between Canada and Florida.

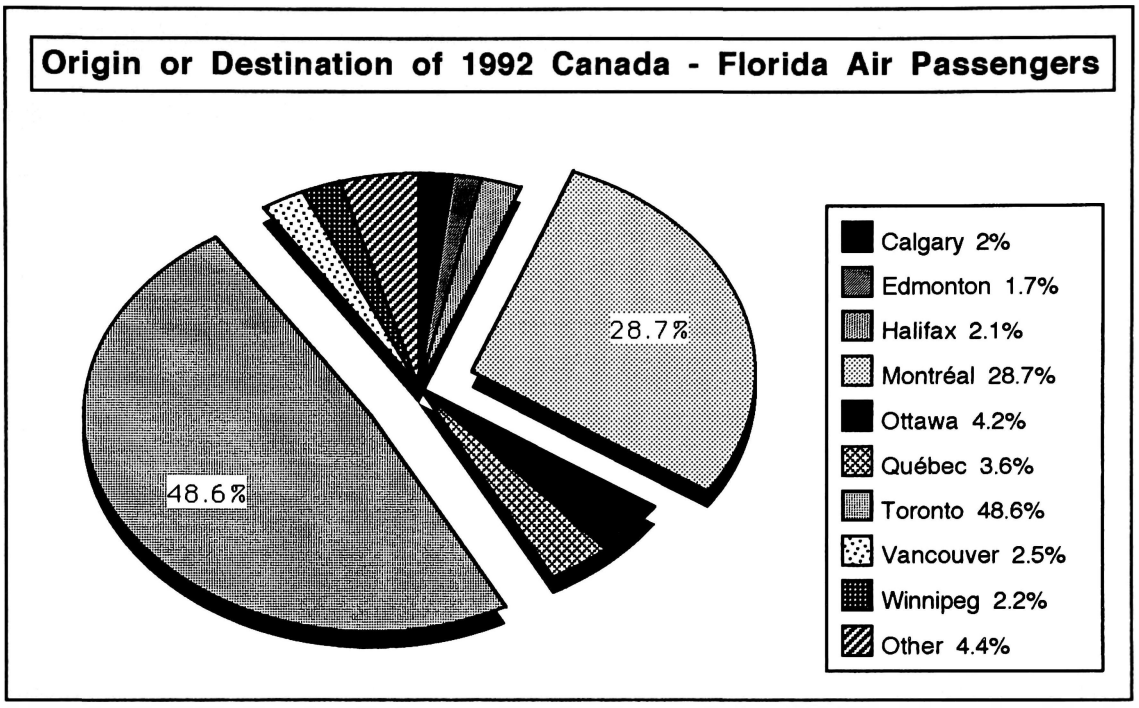


Figure 8. **Comparison of 1992 Canadian City Market Share**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Finally, the development of the Canada - Florida air passenger market can be examined from the perspective of point of destination within the state of Florida. Studying the Canada - Florida market from this perspective is perhaps the most dynamic vantage provided in terms of viewing change and development of the market.

Again, the importance of each Floridian market in terms of number or percentage of enplanements and deplanements must be evaluated. Just as in the analysis of the significant Canadian markets, the important or relevant Floridian markets must also be exposed. In this scenario, points in Florida will be considered to be the destination point.

There are eleven potential destinations in Florida analyzed within this research. Figure 9 exhibits the percentage of annual market share for nine of the eleven Florida destinations. The graph indicates each city's market share out of the total Canada - Florida air passenger market in periodic intervals from 1971 to 1992.

The legend in the right corner of the graph gives each city's three letter city code where: MIA - Miami, TPA - Tampa, FLL - Ft. Lauderdale, MCO - Orlando, PIE - St. Petersburg, FMY - Ft. Myers, PBI - West Palm Beach, SRQ - Sarasota, and DAB - Daytona Beach. Jacksonville and Melbourne were omitted from this figure. These markets have had little impact on the overall development of the Canada - Florida air passenger market.

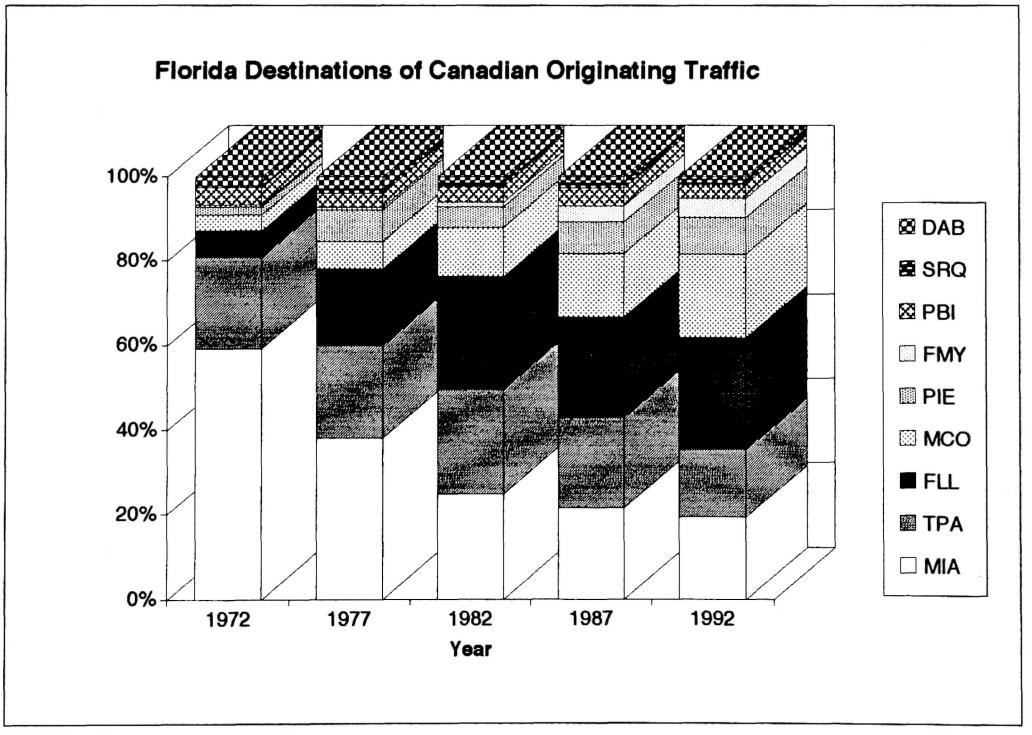


Figure 9. **Comparison of Historical Floridian Market Share**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Over the course of 22 years there have been dramatic changes in the Florida destinations Canadian air travellers frequent most. These changes can be attributed to the development of new tourism markets within Florida and to some degree a shift in passenger traffic from one Florida destination to another. Needless to say, some markets have increased their relative market share over the course of the 22 years from 1971 to 1992 while others have lost market share. However, it should be noted that a loss in relative market share does not imply a reduction in enplanements and deplanements.

Figure 9 illustrates that Miami (MIA) lost market share between the years 1972 to 1977, yet during this time frame enplanements and deplanements on the Canada - Miami market increased 70%. (Refer to appendix A page 63.)

As a percentage of the total Canada - Florida air passenger market, both Miami and Tampa lost market share, while Ft. Lauderdale, St. Petersburg, Orlando, and Ft. Myers gained market share. Over the course of 22 years Miami's market share fell from a high of 58% of the total Canada - Florida market in 1972 to only 19% in 1992. Tampa's reduction in market share was not as pronounced as Miami's; it went from 21% in 1972 to 16% in 1992.

On the opposite side of the pendulum, Ft. Lauderdale represented 6% of the Canada - Florida air passenger market in 1972, and by 1992 it accounted for 26% of the total market. By 1992 the Canada - Ft. Lauderdale market had grown to be the largest Canadian air destination in Florida. Also by 1992, Orlando had outpaced both Miami and Tampa for the number two spot as the second largest Canadian destination market in Florida. In 1992 there were four major Floridian destinations, Ft. Lauderdale, Orlando, Miami, and Tampa, each representing between 400,000 to 700,000 annual Canadian enplanements and deplanements. (Refer to appendix A pages 61 - 64.)

Following the four major markets there are three medium sized Floridian destinations, St. Petersburg, Ft. Myers, and West Palm Beach, each representing between 100,000 to 200,000 annual Canadian enplanements and deplanements. The remaining four Canada - Florida air passenger markets including Sarasota, Jacksonville, Daytona Beach, and Melbourne are relatively small accounting for 5,000 to 30,000 annual Canadian enplanements and deplanements. (Refer to appendix A pages 65 - 71.)

Figure 10 on the following page is a graph of the large and medium sized Canada - Florida air passenger markets detailed in the preceding paragraphs. It is difficult to determine a specific trend by looking solely at figure 10.

However, if only the top five markets are viewed, as in figure 11, where the Ft. Lauderdale / Miami markets are combined and the Tampa / St. Petersburg markets are unified, the overall market trend becomes much clearer. It is possible to view the Miami / Ft. Lauderdale and Tampa / St. Petersburg markets as two cohesive markets. The two separate airports in Miami and Ft. Lauderdale are less than 25 miles apart and the Tampa and St. Petersburg airports are less than 20 miles apart.

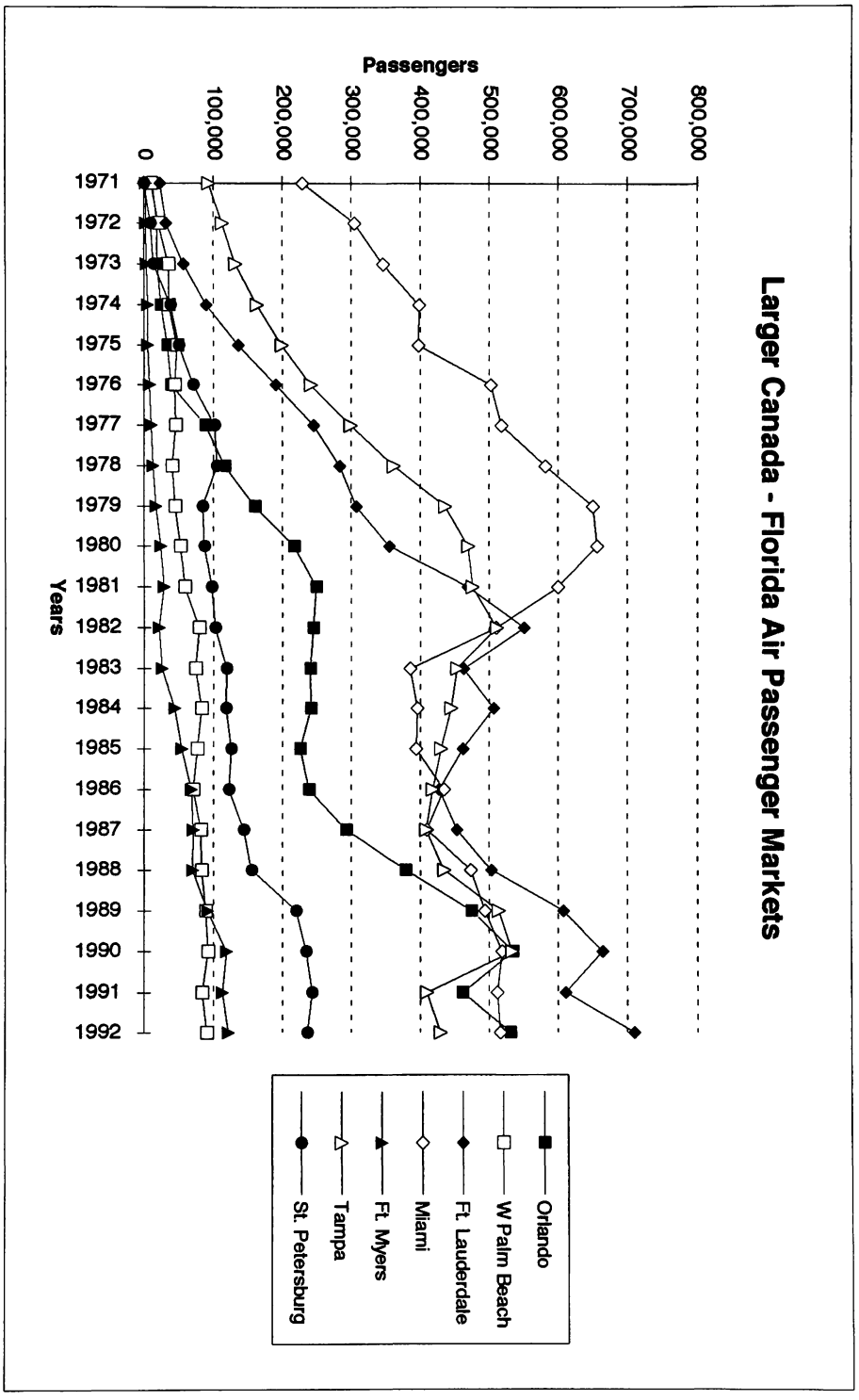


Figure 10. **Individual Canada - Florida Air Passenger Markets**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

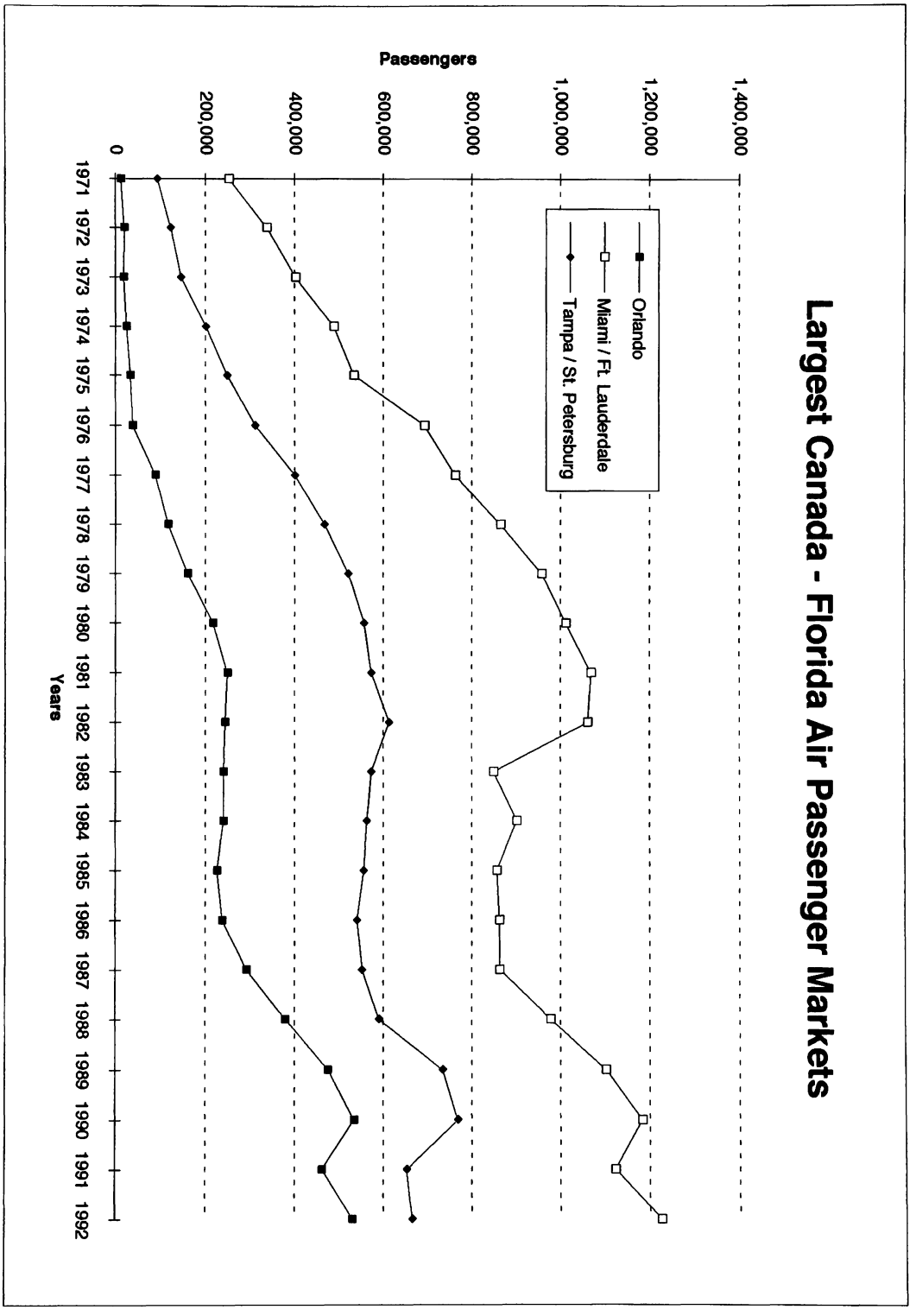


Figure 11. **Three Major Destinations for Canadian Air Passengers**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Chapter Three

FACTORS WHICH INFLUENCED TRAFFIC DEVELOPMENT

Overview of Potential Factors

This chapter centers around determining factors which have impacted or influenced traffic development within the Canada - Florida air passenger market. Factors which have affected the development of traffic in this market may be utilized as independent or explanatory variables in the development of the multiple regression analysis models in the following chapter.

Demand for air passenger service between Canada and Florida arises from a complex interaction of multiple factors. The factors fall broadly into two groups which are summarized on the following page in Table 3.

First, there are the general economic factors that influence demand in all markets. Second, there are the more particular factors that may influence demand on some routes but may be totally absent on others.[19] Doganis goes on further stating that of the general factors affecting demand, the price of air transportation and the level as well as the distribution of personal income in the markets served are perhaps the most important factors. He further states that much of the growth in air travel in the past thirty years can be explained by the falling real price of air transportation and by the growth in personal disposable income.

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[19] Rigas Doganis, **Flying Off Course: The Economics of International Airlines**, 2nd ed., (New York: Harper Collins Academic, 1991; reprint, New York: Routledge, 1992), 216.

Table 3. **Factors Affecting Levels and Growth of Passenger Traffic**
Source: *Flying Off Course: The Economics of International Airlines*

Factors Affecting All Markets	Factors Affecting Particular Routes
Level of personal disposable income	Level of tourist attraction-scenic / climatic
Fare levels	/ historical / religious attributes
Speed of air travel	Adequacy of tourist infrastructure
Convenience of air travel	Comparative prices
Level of economic activity or trade	Exchange rate fluctuations
Population size and growth rate	Travel restrictions
Attitudes toward travel	Historical / cultural links
Length of holidays	Earlier population movements
	Migrant labor flows

Certain factors may have had a greater or lesser impact on the development of the Canada - Florida air passenger market. It is crucial for the most significant factors to be determined so that accurate multiple regression equations can be developed.

Economic and Social Factors

There are several important economic as well as social factors that may have impacted the development of the Canada - Florida air passenger market. One potential factor that is widely tracked and easily quantifiable is the measure of gross domestic product. The Canadian Gross Domestic Product measures the output produced and income earned within Canada.

Another crucial economic factor affecting air passenger traffic is fare level. An important characteristic concerning the price of air fare within this market centers around the segmentation of this air passenger market into scheduled and chartered elements. There is a substantial difference in pricing between these two types of air services. Chartered air services are generally priced lower than scheduled air services.

Chartered air service operators offer large blocks of seats at discount prices to tour operators and travel agents who in turn provide packaged vacations to Canadian leisure travellers. This allows the charter airline to sell its seats at lower prices. Scheduled airlines generally can not match the charter carriers' lowest fares since each scheduled flight is in no way guaranteed of selling each and every seat.

Still another potential factor that may have influenced the development of the Canada - Florida air passenger market is fluctuations in the exchange rate between the Canadian dollar and the US dollar. In the early 1970s the exchange rate between the Canadian dollar and the US dollar was virtually equal, one for one. Then during the late 1970s and 1980s the Canadian dollar steadily lost value against the US dollar. This meant that travel to the state of Florida for Canadians became more expensive. The value of the Canadian dollar reached its lowest level against the US dollar in 1986. In 1986, one Canadian dollar equalled only .72¢ US. After 1986 the exchange rates became more even as the value of the Canadian dollar rose against the US dollar. By 1992, the exchange rate between the two currencies was at late 1970s or early 1980s levels. According to Doganis[20] exchange rate fluctuations may be

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[20] Ibid., 247.

relevant as an explanatory variable in evaluating air passenger traffic growth and changes where leisure traffic is dominant.

Another potentially relevant factor could be the change in the Canadian population. From 1971 to 1992 there was a consistent increase in Canadian population. Also, the natural growth rate of Canada's population has been augmented by substantial flows of immigration.

Other social factors that may have influenced the development of the Canada - Florida air passenger market could include increases in the length of vacation time of Canadians or the attitudes of Canadians toward travel. Undoubtedly of significant importance to air traffic between Canada and Florida is the harsh Canadian winter climate. For most Canadians the climate in Florida during the Winter, when Canada is besieged by cold and snowy conditions and Florida is wrapped in a proverbial blanket of warm air, provides a strong inclination to travel South. While many Canadians visit Florida during the Winter, there is a large segment of older Canadians that dominate this market. These individuals are financially more affluent and take advantage of the convenience and speed of air travel to reach their Floridian destination.

There are other reasons that Canadians enjoy visiting Florida other than the pleasant climate. There are many attractions within the state that appeal to Canadians of all ages. The tremendous growth of attractions in Central Florida has fueled demand for air passenger services. Charter air services have benefitted exceptionally from the growth in tourism in Central Florida. This area of Florida typically attracts younger Canadian tourists. Many of these air passengers are young families with children and these individuals tend to travel during the Summer months, typically when school is out. This newer market segment is helping to make the Canada - Florida air passenger market less seasonal.

Air Service Related Factors

There are several service related factors that may have potentially affected the development of the Canada - Florida air passenger market. The segmentation of the market into scheduled and chartered air services has created distinct difference between these two types of air service.

Scheduled services are limited to two nonstop Floridian destinations as set forth in the Air Transport Agreement signed between Canada and the US in 1966. However, the Nonscheduled Services Agreement, signed by Canada and the US in 1974, extended nonstop charter rights from Canada to an unlimited number of cities and destinations in the US and the state of Florida. In

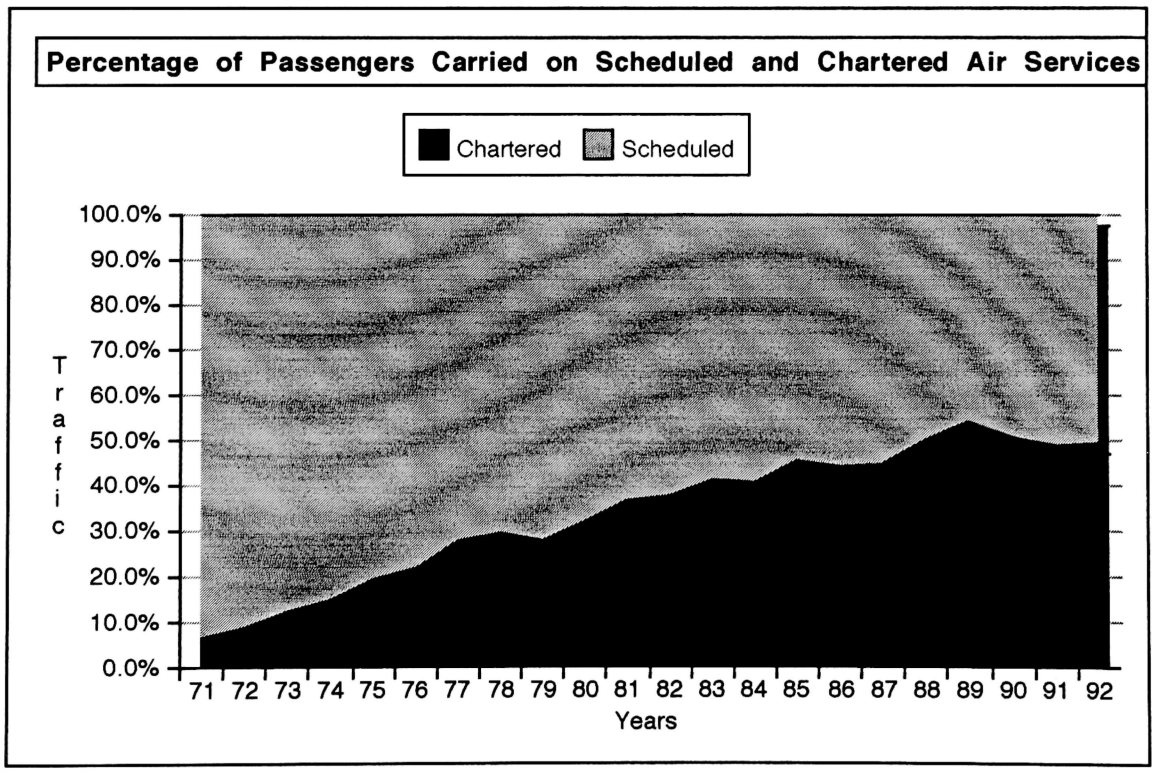

Figure 12. **Percentage of Traffic on Scheduled vs Chartered Services**

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

effect this allows nonstop chartered air services to be provided to all sustainable markets in Florida.

The added element of convenience given to chartered air services through nonstop service between any point in Canada and any point in Florida has resulted in the percentage of passengers carried on chartered air services increasing from approximately 5% in 1971 to approximately 50% in 1992, as documented in figure 12. As long as chartered air services are afforded the advantage of serving all destinations between Canada and Florida on a nonstop basis while scheduled services are restricted to nonstop flights in only two markets, the percentage of passengers carried on chartered air services will continue to grow as the percentage of passengers travelling on scheduled air services decreases.

Government Regulatory Factors

To have a full understanding of the way in which the Canada - Florida air passenger market developed, it is important to understand the governmental regulatory environment that air service providers in this market must comply with. First, this market is an international air passenger market which is governed by a bilateral air service agreement signed between Canada and the US.

The bilateral air service agreement signed between Canada and the US is made up of five separate, major agreements. The agreement governing scheduled air services between Canada and the US is called the Air Transport Agreement and was signed in 1966 and last amended in 1974. There have been notes exchanged between the two nations since 1974 concerning particular routes, however, no major changes have been agreed upon.

The Air Transport Agreement contains principles and rules for regulation of scheduled transborder air services. The agreement was amended in 1974 increasing the total number of transborder air routes from 26 to 54. US air carriers are permitted to serve 26 air routes exclusively and Canadian air carries possess 10 exclusive air routes, while both nations' air carriers can jointly serve 18 air routes. (Refer to appendix B for a complete listing of air routes contained within the Air Transport Agreement of 1966 and the amendment to the Air Transport Agreement of 1974.) In reviewing appendix B the important aspect to note is that no new air routes pertaining to Canada - Florida air service have been agreed upon.

Within the Air Transport Agreement an air route should not be confused with a city-pair. Several of the air routes provide for multiple cities of origin and destination. Of the 54 air routes specified in the amendment to the Air Transport Agreement, approximately 40 are in use to a certain degree as of June 1994.[21] Figure 13 on the following page shows the 51 Canada - US transborder city-pair markets which are currently being served. Including markets served by regional and commuter air services, there are approximately 75 Canada - US transborder city-pair markets served today.

The second part of the Canada - US bilateral air service agreement that directly affects the Canada - Florida air passenger market is the Nonscheduled Services Agreement. This agreement was signed in 1974 and provides liberal transborder charter rights to air carriers from both countries. There is no limit placed upon the frequency of charters in either direction by Canadian air carriers. However, charters by US air carriers are limited to 40% of Canadian

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[21] Official Airline Guide, **Official Airline Guide North American Edition**, (Oak Brook, Illinois: Official Airline Guides, 1994).

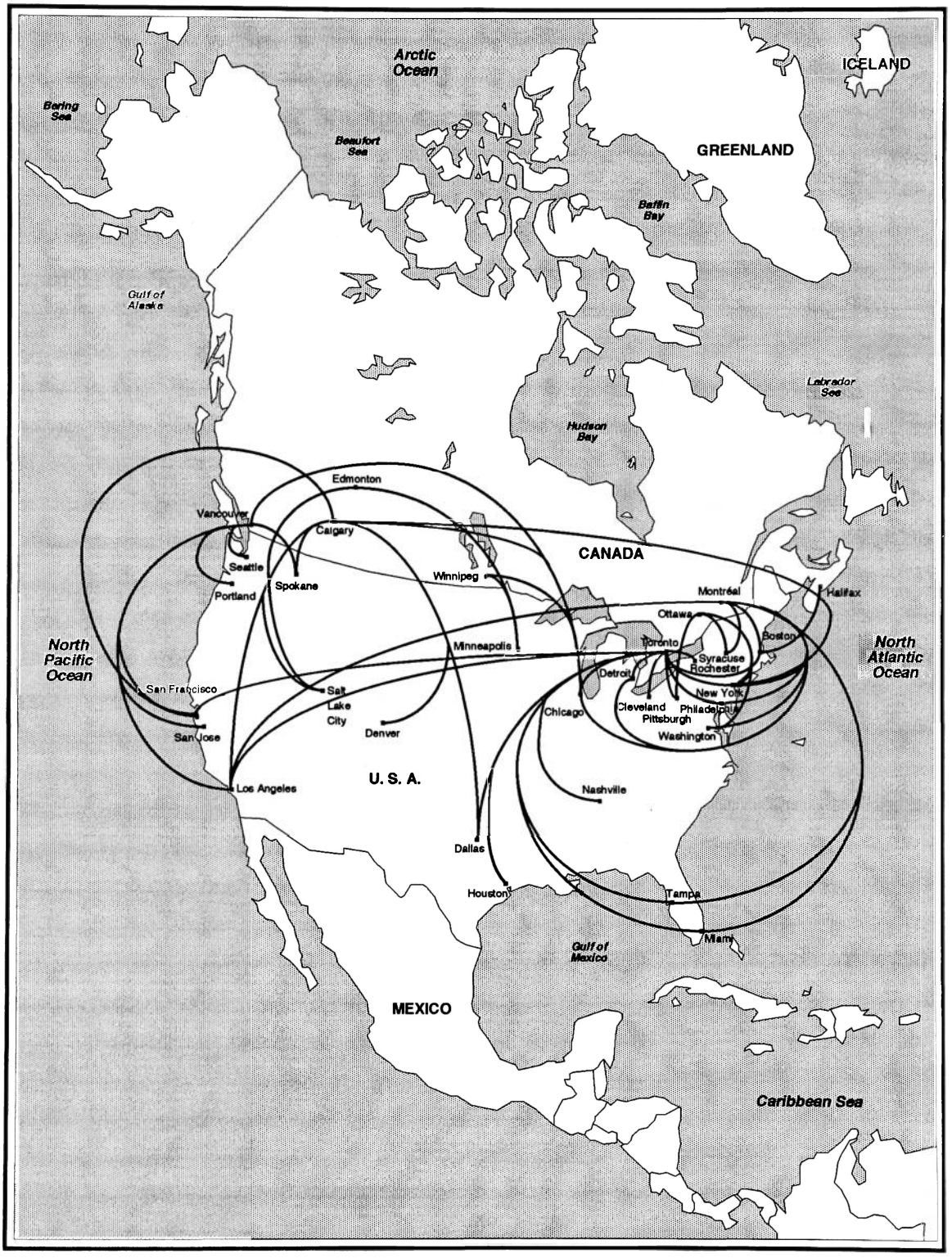

Figure 13. **Scheduled Major Nonstop Transborder Air Services, 1994**
Source: *Official Airline Guide North American Edition*

enplaned southbound traffic on Canadian air carriers.[22] This restriction applies to enplanements in the territory of Canada and deplanements in the states of Hawaii, Florida, California, Arizona and Nevada.

The Preclearance Agreement is the third major element of the Canada - US bilateral air service agreement. The preclearance agreement permits Customs and Immigration officials from one country to pre-clear passengers boarding transborder flights at specified airports in the other country. This agreement allows travellers to enter the other country as domestic passengers. According to Tessenear,[23] there are six southbound, US preclearance facilities located in Canadian airports. These facilities are located in Toronto, Montréal, Winnipeg, Edmonton, Calgary, and Vancouver. Nonstop charter service can be provided from these cities in Canada, where passengers may pre-clear US Customs and travel nonstop to destinations in Florida which do not have US Customs facilities. Daytona Beach has maintained Canadian charter flights from Toronto since 1976 and did not construct a US Customs facility until 1993. Although the agreement also allows for Canadian Customs to locate facilities in the US, none have been established for northbound passengers.

The other two agreements contained within the Canada - US bilateral air service agreement are the Regional, Local, and Commuter Services Agreement and the All-Cargo Notes. As their names suggest these agreements deal with scheduled commuter services and scheduled cargo services. These agreements are not significant to this research.

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[22] Secretary of State, **Canada Nonscheduled Air Services (1974)**, vol. 25, **United States Treaties and Other International Agreements**, (Washington, D.C. : Government Printing Office, 1966).

[23] James A. Tessenear Senior Inspector Department of the Treasury United States Customs Service, interview by author, 25 January 1994, Daytona Beach, Florida, tape recording, Daytona Beach International Airport, Daytona Beach, Florida.

Chapter Four
MULTIPLE REGRESSION MODEL DEVELOPMENT

Multiple Regression Analysis Models

In the previous chapters the Canada - Florida air passenger market has been examined to determine significant trends which have impacted the market between 1971 and 1992. The trends that were uncovered were further analyzed to determine specific factors which influenced air passenger traffic development within the Canada - Florida air corridor. These two steps are the fundamental basis for selecting the independent variables of the multiple regression analysis equations that will be used to explain growth and fluctuations in enplaned and deplaned passengers within the Canada - Florida air passenger market.

As was delineated in the second and third chapters of this research, the Canada - Florida air passenger market is divided into two segments, one comprised of scheduled air passenger services and one made up of chartered air passenger services. These two market segments service the same geographical markets, yet due to governmental regulatory factors they have developed into unique and separate entities. Two separate equations will be formulated utilizing the same independent variables. One equation will designate chartered enplanements and deplanements as the dependent variable and the second will utilize scheduled enplanements and deplanements as its dependent variable

Specification

The next step of the model development process is the specification phase. In this step the independent variables which are most relevant in analyzing the changes in air passenger enplanements and deplanements within the Canada - Florida air passenger market must be selected.

In modeling a complex system, such as the Canada - Florida air passenger market, it is feasible only to consider the most relevant variables. There may be multiple variables which relate to changes in enplanements and deplanements in the Canada - Florida air passenger market. However, it is important to select only those independent variables which can be quantified and that exhibit a strong relationship to the dependent variable.

The hypothesis deals with three particular explanatory variables including Canadian Gross Domestic Product, the ratio of chartered air fare levels and scheduled air fare levels, and the disparity in flight time between chartered flights and scheduled flights. The disparity in flight time refers to the fact that all chartered flights between Canada and Florida may operate as nonstop flights whereas scheduled flights between Canada and Florida can only operate on a nonstop basis between four city-pairs including; Toronto - Miami, Toronto - Tampa, Montréal - Miami, and Montréal - Tampa. All other scheduled air services between Canada and Florida destinations must make an intermediate stop or connection according to the Canada - US bilateral air service agreement. These three independent variables were assumed to be the most significant explanatory variables, from those discussed in chapter four, in explaining variations in passenger enplanements and deplanements within the Canada - Florida air passenger market.

The researcher hypothesized that increases in chartered passenger enplanements and deplanements as a percentage of total traffic transported, as

well as in absolute terms, was attributed to a combination of factors including: continued increases in the standard coach fare of scheduled services, a wide disparity in flight time favoring chartered flights, and a strong rate of growth of Canadian GDP. Also, it was hypothesized that these same factors could explain the much slower growth rate of scheduled air services and the subsequent decline in scheduled passenger traffic as a percentage of total air passenger traffic within the Canada - Florida air passenger market.

Therefore, a ratio of chartered air fare divided by scheduled air fare and a ratio of chartered flight time divided by scheduled flight time was developed so that the changes in each of these market segments could be weighed against each other. The researcher was interested in knowing if a change in chartered air fare for example, was positively correlated to scheduled enplanements and deplanements. Using a ratio of chartered air fare divided by scheduled air fare provided an opportunity to see if this hypothesized relationship existed.

Data Collection

All statistical or quantifiable data concerning the enplanement and deplanement of passengers within the Canada - Florida air passenger market were obtained through the Aviation Statistics Centre of Statistics Canada, a Canadian governmental agency.

Passenger origin and destination statistics are collected in Canada under the authority of the Statistics Act. Data summarized within the publication, *Air Passenger Origin and Destination, Canada - United States Report*, are drawn from lifted passenger flight coupons pertaining to scheduled air transportation.

A 10% continuous systematic sample of flight coupons lifted by the participating Canadian air carriers and the relevant US air carriers is employed.[24]

Chartered air passenger data are collected and compiled from a publication entitled *Air Charter Statistics*. Air carriers that perform international commercial charter air services are required to file charter data with the Aviation Statistics Centre of Statistics Canada. All chartered flights must submit the entire number of passengers they carry to the Canadian government. International air charter statistics are collected monthly on Statement 2 (I, II, III, IV, F) entitled "Charter On-Flight Origin and Destination Report."[25]

The data collected were segmented on the basis of passengers utilizing scheduled and chartered air services. Also, the data were further segmented into inbound and outbound categories. Inbound refers to air passengers inbound from Canada to Florida, while outbound refers to air passengers outbound from Florida to Canada. (Refer to appendix A.)

The next phase involved collecting the necessary data that corresponded to the requisite independent variables selected for the time-series spanning from 1971 to 1992. Table 4 on the following page shows the data collected which corresponds to the appropriate independent and dependent variables. All sources consulted to obtain the appropriate data are disclosed within the context of table 4.

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[24] Statistics Canada, **Air Passenger Origin and Destination, Canada - United States Report**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1993), 90-92.

[25] Statistics Canada, **Air Charter Statistics**, (Ottawa, Canada: Minister of Industry, Science and Technology, 1992), 81-82.

Table 4. **Data Utilized for Regression Analysis Models**

Sources: Enplanements / Deplanements - Statistics Canada
GDP - Statistics Canada
Air Fare - Official Airline Guides, Canadian Holidays, Canada 3000
Flight Time - Official Airline Guides, Canadian Holidays

Year	Scheduled Enplanements/ Deplanements	Chartered Enplanements/ Deplanements	Canadian GDP (in 100,000s)	Ratio Air Fare Level Chartered / Scheduled	Ratio Flight Time Chartered / Scheduled
1971	**363,415**	**24,607**	**286,998**	**0.7346**	**0.6530**
1972	**477,635**	**47,935**	**303,447**	**0.7241**	**0.6530**
1973	**558,830**	**78,644**	**326,848**	**0.7135**	**0.6295**
1974	**674,280**	**115,988**	**341,235**	**0.7043**	**0.6272**
1975	**731,440**	**177,150**	**350,113**	**0.7024**	**0.6170**
1976	**896,860**	**249,892**	**371,688**	**0.6713**	**0.6157**
1977	**994,820**	**380,192**	**385,122**	**0.7316**	**0.6135**
1978	**1,103,930**	**467,303**	**402,737**	**0.7750**	**0.6201**
1979	**1,282,290**	**497,350**	**418,328**	**0.8333**	**0.6232**
1980	**1,341,070**	**616,044**	**424,537**	**0.7463**	**0.6121**
1981	**1,303,160**	**753,538**	**440,127**	**0.6818**	**0.6014**
1982	**1,293,210**	**786,341**	**425,970**	**0.6786**	**0.6093**
1983	**1,076,590**	**761,290**	**439,448**	**0.5953**	**0.6182**
1984	**1,138,400**	**779,721**	**467,167**	**0.6116**	**0.6204**
1985	**1,011,370**	**831,978**	**489,437**	**0.6208**	**0.6050**
1986	**1,031,260**	**815,761**	**505,666**	**0.6744**	**0.6007**
1987	**1,066,370**	**866,577**	**526,730**	**0.6868**	**0.5915**
1988	**1,083,340**	**1,082,531**	**552,958**	**0.7047**	**0.6000**
1989	**1,160,900**	**1,383,142**	**566,486**	**0.5353**	**0.6051**
1990	**1,370,810**	**1,391,743**	**565,576**	**0.6597**	**0.5922**
1991	**1,269,510**	**1,225,747**	**556,029**	**0.5698**	**0.5986**
1992	**1,366,880**	**1,336,632**	**560,048**	**0.5360**	**0.6051**

Calibration and Evaluation

The ordinary least-squares estimation procedure is employed to estimate the equation coefficients. The regression model corresponding to chartered enplaned and deplaned passengers, between Canada and Florida, will be evaluated first. This will be followed by the evaluation of the regression model corresponding to scheduled enplaned and deplaned passengers between Canada and Florida.

The first regression equation is as follows:

$$Y = (4.420E\text{-}06)X_1 - 619{,}660.39X_2 - 1{,}334{,}607.20X_3 + \in$$

where
- Y represents the dependent variable chartered enplanements and deplanements
- X_1 represents Canadian GDP
- X_2 represents a ratio of chartered air fare / scheduled air fare
- X_3 represents a ratio of chartered flight time / scheduled flight time

First note that the signs of the coefficients are correct. An increase in Canadian GDP is indicated to increase the chartered enplanements and deplanements within the Canada - Florida air passenger market. This relationship is theoretically correct.

In evaluating the signs of the other two independent variables it is important to remember that they are ratios. The air fare ratio consists of chartered air fare divided by scheduled air fare. As chartered air fare increases, the value of the ratio increases. Therefore, a negative sign or correlation indicates that as chartered air fare increases, thereby increasing the overall ratio, traffic decreases. The sign of the ratio of chartered air fare to scheduled air fare is correct. The coefficient of the variable representing the ratio of

chartered flight time to scheduled flight time is also correctly stated as being negative.

The R^2 for the multiple regression equation is 0.97. The quantity R^2 is known as the coefficient of determination and is the most commonly used measure of the goodness of fit of a regression line. The R^2 measures the proportion or percentage of the total variation in *Y* explained by the regression model.[26] The value for R^2 of 0.97 demonstrates a strong relationship between the variations of the dependant variable and the independent variables. The three independent variables explain 97% of the variations in chartered enplanements and deplanements within the Canada - Florida air passenger market. However, one should not judge a model based on R^2 alone.

The *F* test or statistic is an alternative statistic for evaluating the overall significance or "goodness of fit" of a regression equation. Unlike the R^2 statistic, which compares the explained variation to the total variation, the *F* statistic is formed by comparing the explained variance to the unexplained variance.[27] Given the number of observations, the degrees of freedom, and a specified confidence level of 95% the *F* statistic value for this equation must be greater than 3.52. The *F* statistic for the regression equation is 180.74 indicating that it is significant.

The *T* statistic values for the three independent variables are provided in Table 5. For the *T* statistic values of the independent variables of this regression equation to be statistically significant, at a confidence level of 95%, their numerical value must be greater than +/- 1.734. Table 5 demonstrates that

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[26] Damodar Gujarati, **Basic Econometrics**, (New York: McGraw-Hill Inc., 1978), 49.

[27] Nawal K. Taneja, **Airline Traffic Forecasting: A Regression Analysis Approach**, (Lexington, Massachusetts: D.C. Heath and Company, 1988), 46.

Table 5. ***T* Statistic Values for Chartered Regression Equation**

Variables	Canadian GDP	Ratio Chartered Air Fare / Scheduled Air Fare	Ratio Chartered Flight Time / Scheduled Flight Time
T Statistic	11.56	-2.12	-2.69

all of the independent variables including Canadian GDP, the ratio air fare level, and the ratio flight time are all statistically significant.

The table demonstrates that the growth of Canadian GDP between 1971 and 1992 was highly significant in explaining the growth of chartered air traffic within the Canada - Florida air corridor. Also, the air fare disparity, measured by the ratio of chartered air fare divided by scheduled air fare, indicates that the increasing gap between scheduled air fare and chartered air fare had an effect on chartered traffic. As scheduled air fares between Canada and Florida increased, the chartered air services became more attractive to price sensitive leisure passengers.

The variable that measured flight time was also a ratio. This variable can be viewed as a measure of convenience. The variable indicated that the disparity between scheduled flight time and chartered flight time was significant to the growth and fluctuation of chartered traffic. Primarily, chartered air services between Canada and Florida benefited from the fact that they may operate between any point in Canada and any point in Florida on a nonstop basis. However, scheduled air services between Canada and Florida are restricted to two Florida destinations from two markets in Canada.

An added tool to evaluate the correlation between the independent variables and the dependent variable, a correlation matrix, is shown in table 6. Also, the relationships between the independent variables can be evaluated with table 6.

Table 6. **Correlation Matrix for Chartered Regression Equation**

Variables	Chartered Enp. & Dep.	Canadian GDP	Air Fare Ratio	Flight Time Ratio
Chartered Enp. & Dep.	**1.00**	**0.98**	**-0.65**	**-0.78**
Canadian GDP	**0.98**	**1.00**	**-0.60**	**-0.83**
Air Fare Ratio	**-0.65**	**-0.60**	**1.00**	**0.38**
Flight Time Ratio	**-0.78**	**-0.83**	**0.38**	**1.00**

All of the independent variables show substantial correlation with the dependent variable of greater than +/- 0.65. Canadian GDP exhibits a positive correlation of 0.98. Both the air fare ratio and the flight time ratio show negative correlations to the dependent variable of -0.65 and -0.78 respectively. These results substantiate the assumption that changes in chartered air service enplanements and deplanements can be explained by changes in the independent variables.

The correlation matrix can also be used to check for multicollinearity. Multicollinearity is a modeling error where there is a strong relationship between the independent variables. If a strong relationship between the independent variables exists the results of the regression can be misleading. A strong negative relationship of -0.83 was found to exist between Canadian GDP and the flight time ratio. This is the only pair of variables that indicate a substantial correlation.

One other means of examining the relationship between the dependent variable and the independent variables is through the Durbin-Watson *D* statistic. This statistic is calculated from the estimated residuals of the regression analysis. The Durbin-Watson *D* statistic for this regression model is 1.60 which suggest that there is no serial correlation.

The second regression equation to be evaluated corresponds to scheduled enplaned and deplaned passengers between Canada and Florida. With this equation the same independent variables were utilized. Here again, the goal was to create a model that explained the past changes or fluctuations in air passenger enplanement and deplanement levels.

The second regression equation is as follows:

$$Y = (1.295E\text{-}06)X_1 + 572{,}758.90X_2 + 435{,}101.08X_3 + \in$$

where
- Y represents the dependent variable scheduled enplanements and deplanements
- X_1 represents Canadian GDP
- X_2 represents a ratio of chartered air fare / scheduled air fare
- X_3 represents a ratio of chartered flight time / scheduled flight time

Notice that the signs of the coefficients are correct. There is a positive correlation between GDP and traffic. The two ratio variables for the scheduled regression equation are also positively correlated.

Since the air fare ratio is chartered air fare divided by scheduled air fare, as scheduled air fare increase, the denominator increases, thereby reducing the entire ratio. A positive correlation for this variable is theoretically correct since as the numerical value of the ratio decreases passengers enplaned and deplaned decrease as well.

The same principal applies for the ratio of chartered flight time divided by scheduled flight time. Therefore, as the numerical value of the ratio decreases, passengers enplaned and deplaned decrease as well, resulting in a positive correlation.

The R^2 for this multiple regression equation is 0.87. Generally, an R^2 value of 0.90 is preferred.[28] However, an R^2 value of 0.87 suggest that there is a relationship between the dependent variable and the chosen independent variables.

The *F* statistic for this equation is 36.68. Taking into consideration the number of observations, the degrees of freedom, and a specified confidence level of 95% the *F* statistic value is well above the required level of 3.52. This suggests that the multiple regression equation as a whole is significant.

Table 7. ***T* Statistic Values for Scheduled Regression Equation**

Variables	Canadian GDP	Ratio Chartered Air Fare / Scheduled Air Fare	Ratio Chartered Flight Time / Scheduled Flight Time
T Statistic	1.20	1.74	0.46

Table 7 details the *T* statistics for the three independent variables. Only one of the independent variables within this equation is statistically significant. The ratio of chartered air fare to scheduled air fare appears to be the only relevant independent variable within this equation.

Next, the relationship between the dependent variable and the independent variables can be further examined with a correlation matrix. This matrix will be abbreviated since the same independent variables utilized within this equation were also utilized in the prior equation concerning chartered enplanements and deplanements. Refer to Table 6, to examine correlation between the independent variables.

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[28] Ibid., 247.

Table 8 shows the correlation between the dependent variable, scheduled enplanements and deplanements, and the three independent variables. Both Canadian GDP and the flight time ratio show substantial correlations with the dependent variable. Canadian GDP is positively correlated with scheduled passenger enplanements and deplanements at 0.74. The flight time ratio is negatively correlated with the dependent variable at -0.70. However, the independent variable, air fare ratio, shows a weak -0.24 correlation.

Table 8. **Correlation Matrix for Scheduled Regression Equation**

Variables	Scheduled Enplanements and Deplanements
Scheduled Enplanements and Deplanements	**1.00**
Canadian GDP	**0.74**
Air Fare Ratio	**-0.24**
Flight Time Ratio	**-0.70**

The Durbin-Watson *D* statistic for the scheduled multiple regression analysis equation is 1.61. This suggests that there is no autocorrelation present in this equation.

This regression equation does not appear to be as statistically significant as the prior equation. Limitations of the data due to the scarce availability and proprietary nature of such information may have limited the statistical significance of the equation. Also, there may be other independent variables which were not included in the equation that may prove relevant in gauging scheduled air passenger traffic between Canada and Florida.

Chapter Five
SUMMARY AND CONCLUSIONS

Findings

This research was designed to explain the growth and fluctuation of air passenger enplanements and deplanements within the Canada - Florida air passenger market. Two separate multiple regression models were used to explain changes in air passenger traffic in both the scheduled and chartered segments of this market. Three independent variables including Canadian GDP, a ratio of chartered air fare divided by scheduled air fare, and a ratio of chartered flight time divided by scheduled flight time were selected for both equations.

The results of the equation relating to chartered enplaned and deplaned passengers indicated that the three variables were highly significant in explaining changes and fluctuations in chartered enplanements and deplanements. The equation had a high R^2 of 0.97 and a significant *F* statistic of 180.74. The *T* statistic values indicated that the three independent variables were all statistically significant. Fluctuations in Canadian GDP appeared to be highly significant. The correlation matrix indicated that all of the independent variables possessed strong correlations greater than +/- 0.65. The Durbin-Watson *D* statistic for the model was 1.60 indicating no serial correlation. Based on the significance of the model in explaining the development and fluctuations of chartered enplaned and deplaned air passengers within the

Canada - Florida air passenger market, the first part of the hypothesis, section **(A)**, is validated and the null hypothesis H_O is accepted.

The results of the equation relating to scheduled enplaned and deplaned passengers within the Canada - Florida air passenger market indicates that the three independent variables including Canadian GDP, the ratio of chartered air fare divided by scheduled air fare, and the ratio of chartered flight time divided by scheduled flight time, were not as significant at explaining fluctuations in the dependent variable as the researcher had anticipated. The R^2 value for the equation was 0.87. The value for the *F* statistic was significant at 36.68. However, two of the three independent variables, Canadian GDP and the ratio of chartered flight time divided by scheduled flight time had *T* statistic values that were below the numerical value needed to be statistically significant. The ratio of chartered air fare divided by scheduled air fare exhibits a *T* statistic value that at best is borderline. Weak or statistically insignificant *T* statistic values question the underlying relationship purported to exist between the independent variables and the dependent variable. The Durbin-Watson *D* statistic for the equation suggests no autocorrelation with a value of 1.61.

While the independent variables selected do show a correlation to fluctuations in the dependent variable. The selection of different independent variables to explain changes in scheduled enplaned and deplaned passengers might provide for a more robust regression equation. Therefore, for this regression model the null hypothesis for the second section **(B)** of the hypothesis is rejected and the alternative hypothesis H_A will be validated.

There are certain limitations to this research that should be pointed out and that may have affected the regression equations. First, the collection of time-series data pertaining to scheduled as well as chartered air fares was complicated by the numerous fares offered between each city-pair. Obtaining

the average yield from the various airlines would provide the best measure of air fare. However, this type of data is regarded as proprietary information by the airlines and is not disclosed to the public. Another problem encountered was the lack of published information regarding air fares for chartered air carriers. Obtaining information pertaining to the appropriate time-series, from 1971 to 1992, directly from charter operators proved difficult due to the elimination of service by certain operators and multiple mergers. Few of the major chartered service operators today operated in the early 1970s

"Open Skies"

Concerning future research pertaining to the Canada - Florida air passenger market and how the market might change, a close examination of the proposed "Open Skies" treaty between Canada and the US is warranted. As was pointed out in this research, governmental regulation of air passenger service between international points such as Canada and Florida is one of the most influential factors affecting the development and type of air service provided. A change in the regulations governing over this market would undoubtedly affect the overall make-up of this important international exchange of air service.

Negotiations by the Canadian and US Governments concerning an "Open Skies" treaty between the two nations began on April 11, 1991.[29] When negotiations began in 1991, both sides agreed to explore establishing a regime that would allow carriers to operate from all points in one country to all points in the other country. An open transborder agreement or "Open Skies" would

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[29] Paul G. Ouimet, **Canada - U.S. Air Industry: Debating "Open Skies"**, (Vancouver, Canada: Western Transportation Advisory Council, 1991), 1.

mean that scheduled air carriers could provide nonstop service between points in Canada and destinations in Florida.

However, after six scheduled rounds of talks between 1991 and 1992 the agreement is no closer to being signed. Since the last formalized talks in 1992 there have been several informal meetings between individuals of the Canadian and American governments. Yet, as of this date, these discussions have failed to reinstate formal negotiations between the two governments concerning the proposed "Open Skies" treaty.

There are several key issues which have muddled the negotiating process. One issue concerns the phase-in period concerning the open transborder agreement. Canada would like an eight year phase-in period where American air carriers would not be permitted to serve any new transborder city-pair markets, yet Canadian air carriers would be allowed to serve any transborder city-pair market. US negotiators have proposed a six year phase-in period.[30]

Other issues concern the ability of Canada's airlines to compete with the much larger US carriers under a more open agreement. Factors which have arisen include: higher taxes and operating costs in Canada; size and dispersion of the US market; hub-and-spoke systems of US air carriers; pre-clearance facilities which give US airlines a marketing advantage; and access to major US airports.[31]

However, many of these proverbial "logjams" are beginning to break. Air Canada's acquisition of a stake in Continental Airlines and its code sharing and

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[30] Matthew Rooney Negotiator, interview by author, 31 January 1994, Washington D.C., telephone, Office of Aviation Negotiations, State Department, Washington, D.C.

[31] Paul G. Ouimet, **Canada's Air Industry: Developments and Issues Since 1986**, (Vancouver, Canada: Western Transportation Advisory Council, 1992), 3.

cooperative marketing relationship has provided the Canadian air carrier with a large, convenient hub located in Newark. Also, Canadian International Airlines' affiliation with American Airlines provides the second largest Canadian air carrier with a US airline partner.

This researcher no longer questions whether or not an open transborder agreement will be signed. When will the open transborder air agreement be signed, is a more relevant question. One thing is for certain, an open border air service agreement would change the Canada - Florida air passenger market. Undoubtedly, there would be an increase in nonstop air service initiated by scheduled air carriers. These alterations would change the composition of the Canada - Florida air passenger market.

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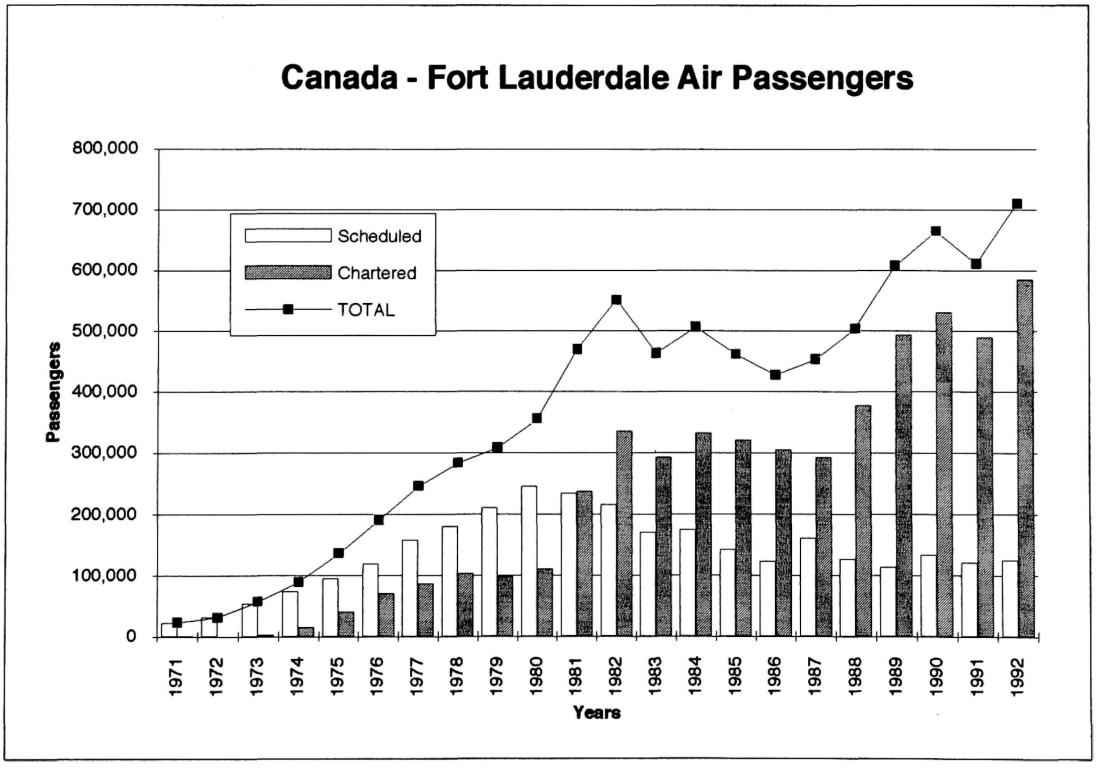
APPENDIX A

INDIVIDUAL CANADA - FLORIDA MARKETS' ANNUAL ENPLANEMENTS AND DEPLANEMENTS

Annual Canada - Ft. Lauderdale Enplanements and Deplanements

CANADA - FORT LAUDERDALE AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	11,710	11,300	23,010	213	214	427	23,437
1972	16,165	15,535	31,700	92	90	182	31,882
1973	28,025	26,480	54,505	1,613	1,073	2,686	57,191
1974	37,900	36,400	74,300	7,927	7,665	15,592	89,892
1975	48,800	46,160	94,960	21,384	19,881	41,265	136,225
1976	61,410	58,470	119,880	35,437	35,395	70,832	190,712
1977	81,380	77,180	158,560	43,629	43,424	87,053	245,613
1978	92,030	87,830	179,860	52,012	51,253	103,265	283,125
1979	106,080	103,900	209,980	49,573	48,325	97,898	307,878
1980	123,930	120,830	244,760	56,748	54,350	111,098	355,858
1981	118,090	115,210	233,300	125,678	110,560	236,238	469,538
1982	108,730	106,930	215,660	164,150	170,943	335,093	550,753
1983	86,130	84,460	170,590	148,043	144,876	292,919	463,509
1984	88,430	86,510	174,940	164,711	166,927	331,638	506,578
1985	70,320	71,470	141,790	159,799	160,655	320,454	462,244
1986	59,830	63,570	123,400	152,851	151,756	304,607	428,007
1987	82,120	79,140	161,260	147,788	144,383	292,171	453,431
1988	63,840	63,100	126,940	187,424	189,528	376,952	503,892
1989	57,180	56,890	114,070	242,558	251,397	493,955	608,025
1990	67,550	66,820	134,370	265,802	264,336	530,138	664,508
1991	61,520	60,070	121,590	241,426	248,385	489,811	611,401
1992	64,220	61,010	125,230	292,272	292,801	585,073	710,303

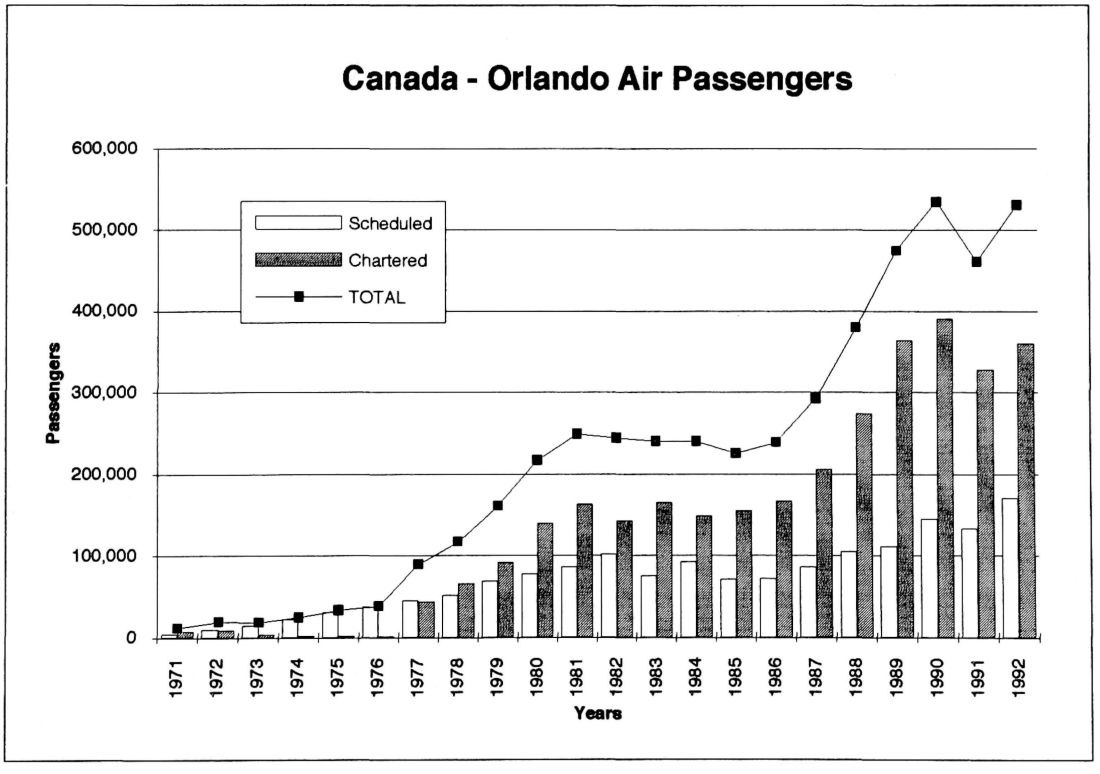


Graphical Representation of Annual Canada - Ft. Lauderdale Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Orlando Enplanements and Deplanements

CANADA - ORLANDO AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	2,185	2,230	4,415	951	6,808	7,759	12,174
1972	5,135	5,145	10,280	4,392	4,793	9,185	19,465
1973	7,545	7,470	15,015	1,786	2,049	3,835	18,850
1974	11,760	10,960	22,720	1,034	948	1,982	24,702
1975	15,730	15,610	31,340	1,056	1,352	2,408	33,748
1976	19,020	18,360	37,380	751	467	1,218	38,598
1977	23,310	22,160	45,470	22,190	21,346	43,536	89,006
1978	25,740	25,400	51,140	33,327	32,202	65,529	116,669
1979	34,360	34,620	68,980	47,154	44,650	91,804	160,784
1980	38,920	38,960	77,880	70,305	69,063	139,368	217,248
1981	42,820	43,100	85,920	82,624	80,361	162,985	248,905
1982	50,410	51,530	101,940	71,406	70,861	142,267	244,207
1983	37,400	37,920	75,320	83,609	81,479	165,088	240,408
1984	45,850	46,260	92,110	73,616	75,210	148,826	240,936
1985	35,330	35,540	70,870	76,978	77,900	154,878	225,748
1986	35,470	36,800	72,270	82,473	83,996	166,469	238,739
1987	42,900	43,460	86,360	102,672	103,375	206,047	292,407
1988	52,900	52,100	105,000	134,310	139,785	274,095	379,095
1989	55,300	55,680	110,980	176,182	187,670	363,852	474,832
1990	72,050	72,530	144,580	190,349	199,579	389,928	534,508
1991	66,900	66,400	133,300	160,983	166,894	327,877	461,177
1992	86,080	84,850	170,930	177,258	182,723	359,981	530,911

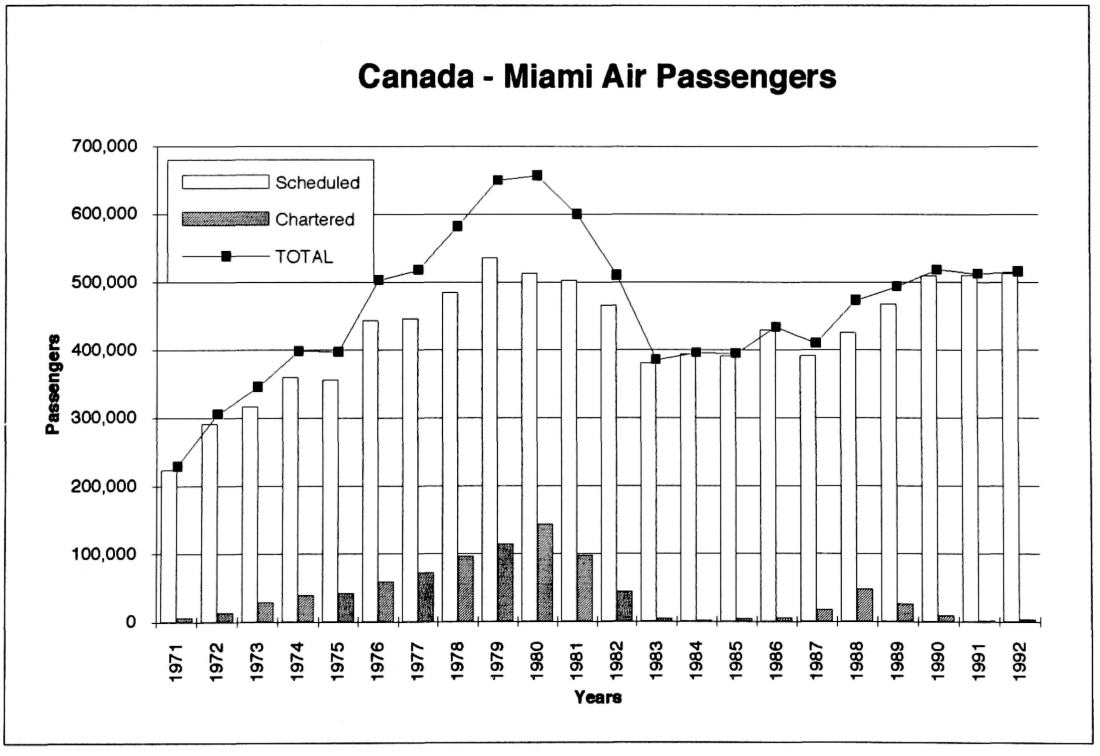


Graphical Representation of Annual Canada - Orlando Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Miami Enplanements and Deplanements

CANADA - MIAMI AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	113,770	109,380	223,150	2,872	2,904	5,776	228,926
1972	149,520	142,055	291,575	7,058	6,586	13,644	305,219
1973	162,080	154,810	316,890	14,383	14,506	28,889	345,779
1974	183,810	175,990	359,800	19,895	18,777	38,672	398,472
1975	181,510	174,250	355,760	21,654	20,420	42,074	397,834
1976	227,380	216,550	443,930	29,979	28,560	58,539	502,469
1977	228,790	217,330	446,120	37,297	34,717	72,014	518,134
1978	247,740	237,540	485,280	49,303	47,105	96,408	581,688
1979	271,580	264,690	536,270	57,557	56,954	114,511	650,781
1980	259,850	253,600	513,450	71,530	71,959	143,489	656,939
1981	254,920	247,730	502,650	47,698	49,367	97,065	599,715
1982	236,480	229,910	466,390	20,765	23,436	44,201	510,591
1983	191,400	189,500	380,900	2,333	2,222	4,555	385,455
1984	197,340	196,550	393,890	602	1,180	1,782	395,672
1985	195,860	194,810	390,670	1,981	1,985	3,966	394,636
1986	215,860	213,230	429,090	2,631	2,726	5,357	434,447
1987	198,300	193,580	391,880	8,990	8,692	17,682	409,562
1988	214,930	210,920	425,850	24,339	23,600	47,939	473,789
1989	237,010	230,730	467,740	13,709	12,254	25,963	493,703
1990	256,300	253,510	509,810	4,157	4,819	8,976	518,786
1991	257,010	253,190	510,200	863	944	1,807	512,007
1992	258,300	254,730	513,030	1,472	1,607	3,079	516,109

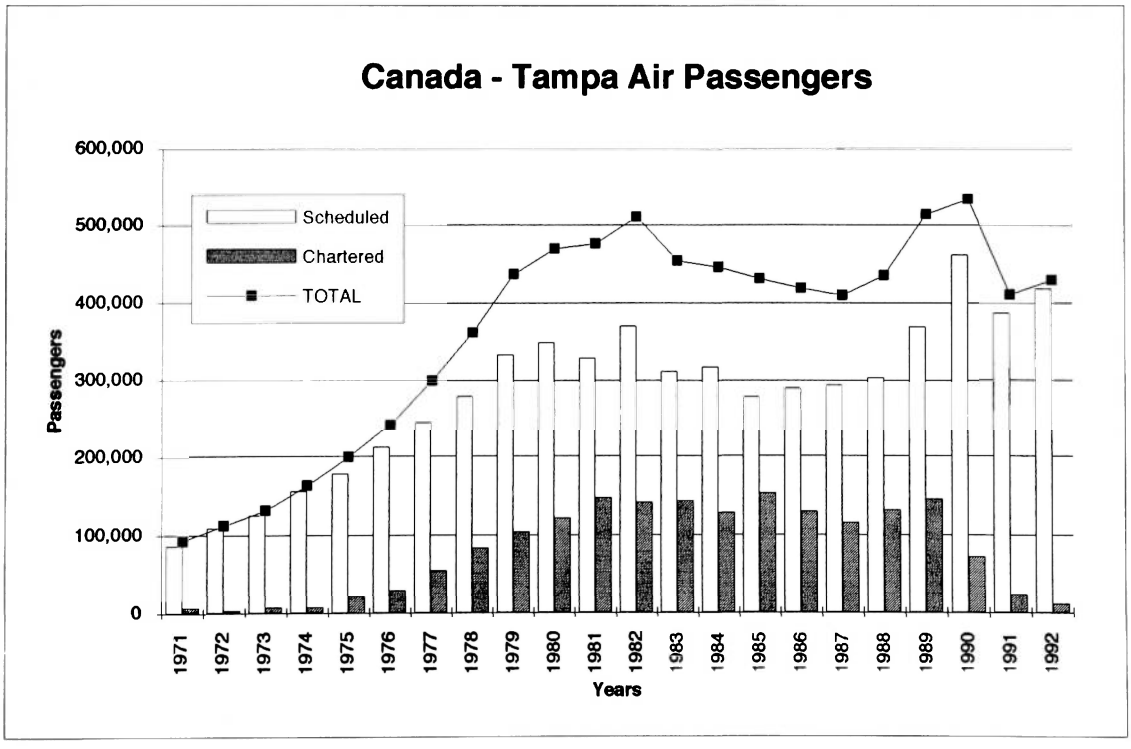


Graphical Representation of Annual Canada - Miami Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Tampa Enplanements and Deplanements

CANADA - TAMPA AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	43,195	42,710	85,905	6,407	620	7,027	92,932
1972	55,710	53,810	109,520	1,859	1,463	3,322	112,842
1973	63,340	61,595	124,935	3,838	3,233	7,071	132,006
1974	78,940	76,420	155,360	3,903	3,613	7,516	162,876
1975	90,520	87,410	177,930	10,850	10,019	20,869	198,799
1976	107,120	104,530	211,650	15,099	14,163	29,262	240,912
1977	124,400	119,740	244,140	27,962	27,164	55,126	299,266
1978	140,180	137,790	277,970	42,531	41,209	83,740	361,710
1979	166,850	165,890	332,740	52,265	52,006	104,271	437,011
1980	175,660	172,590	348,250	62,341	59,491	121,832	470,082
1981	165,210	163,610	328,820	74,138	73,161	147,299	476,119
1982	185,810	184,110	369,920	68,612	72,819	141,431	511,351
1983	156,540	154,430	310,970	72,857	70,026	142,883	453,853
1984	158,930	158,100	317,030	63,557	64,998	128,555	445,585
1985	139,490	138,100	277,590	76,048	77,142	153,190	430,780
1986	145,440	143,490	288,930	64,649	64,880	129,529	418,459
1987	147,460	145,970	293,430	59,155	56,567	115,722	409,152
1988	152,330	150,850	303,180	66,672	65,247	131,919	435,099
1989	184,580	184,240	368,820	74,006	71,424	145,430	514,250
1990	231,050	230,640	461,690	36,899	35,435	72,334	534,024
1991	194,000	192,660	386,660	11,866	11,488	23,354	410,014
1992	210,360	207,680	418,040	5,271	6,065	11,336	429,376

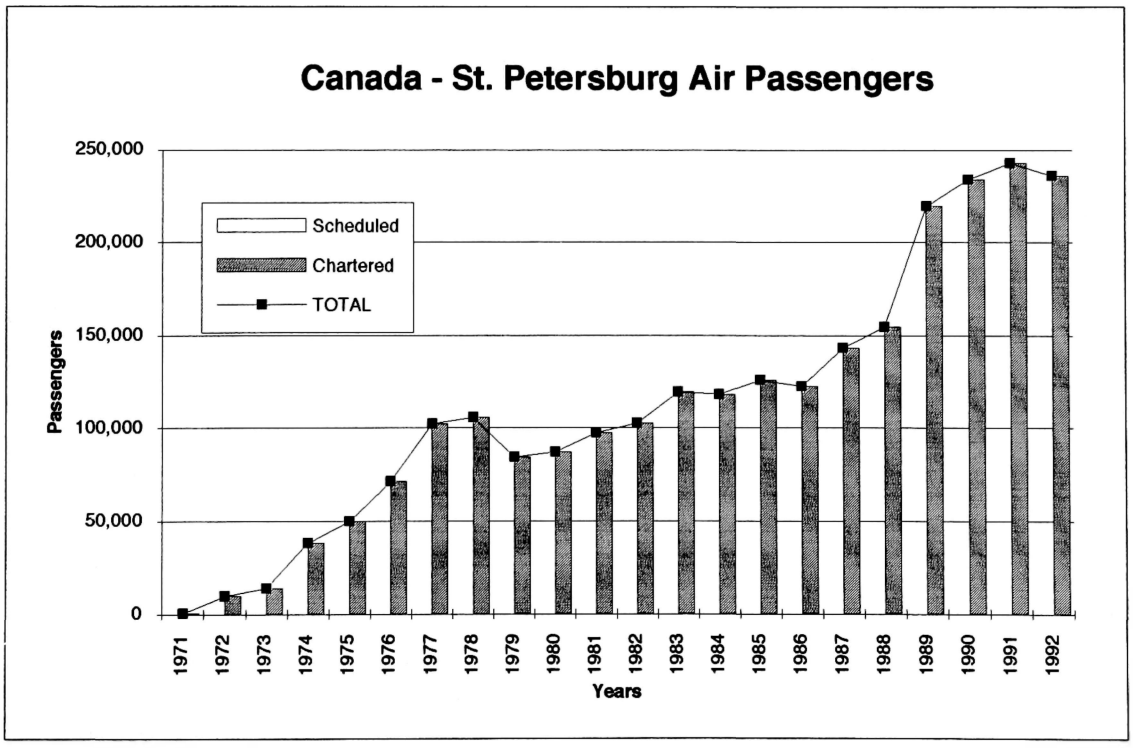


Graphical Representation of Annual Canada - Tampa Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - St. Petersburg Enplanements and Deplanements

CANADA - ST. PETERSBURG AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	0	0	0	229	130	359	359
1972	0	0	0	5,090	4,733	9,823	9,823
1973	0	0	0	6,968	6,988	13,956	13,956
1974	0	0	0	19,651	18,690	38,341	38,341
1975	0	0	0	25,083	24,944	50,027	50,027
1976	0	0	0	35,651	35,637	71,288	71,288
1977	0	0	0	51,218	50,866	102,084	102,084
1978	0	0	0	53,057	52,453	105,510	105,510
1979	0	0	0	42,853	41,551	84,404	84,404
1980	0	0	0	44,703	42,327	87,030	87,030
1981	0	0	0	49,317	48,055	97,372	97,372
1982	0	0	0	51,142	51,405	102,547	102,547
1983	0	0	0	59,904	59,430	119,334	119,334
1984	0	0	0	57,868	60,223	118,091	118,091
1985	0	0	0	62,793	62,995	125,788	125,788
1986	0	0	0	61,018	61,394	122,412	122,412
1987	0	0	0	71,963	71,628	143,591	143,591
1988	0	0	0	77,753	77,051	154,804	154,804
1989	0	0	0	109,235	110,386	219,621	219,621
1990	0	0	0	117,577	116,415	233,992	233,992
1991	0	0	0	121,486	121,542	243,028	243,028
1992	0	0	0	118,728	117,441	236,169	236,169

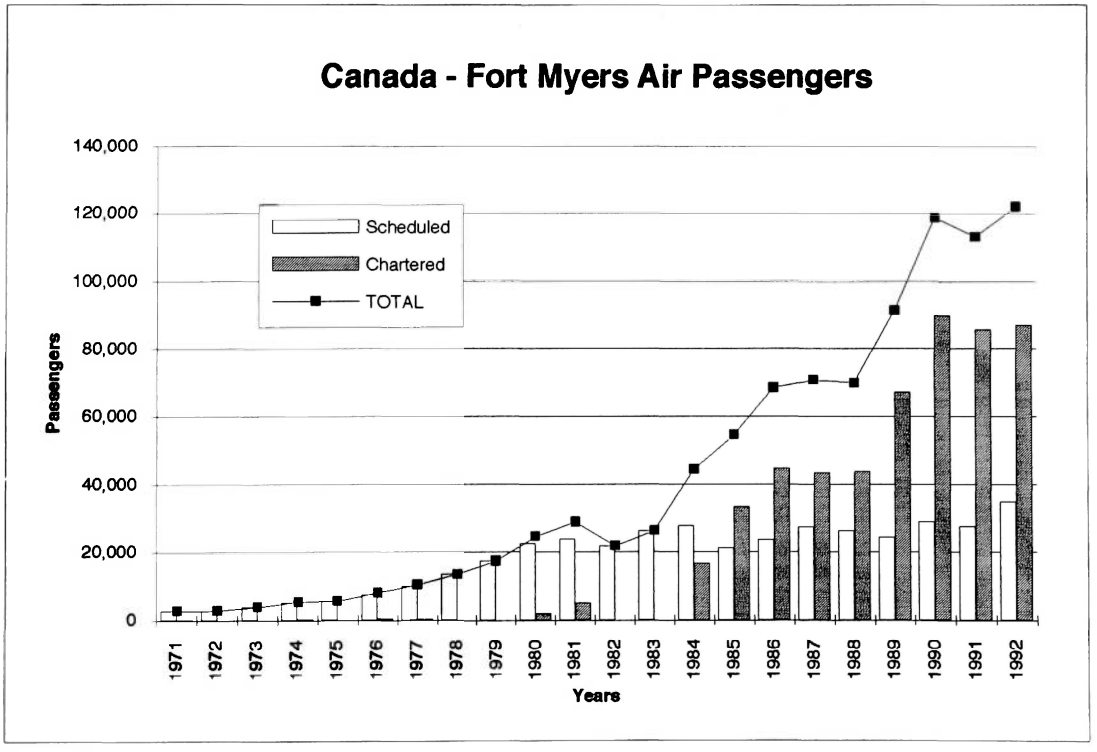


Graphical Representation of Annual Canada - St. Petersburg Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Ft. Myers Enplanements and Deplanements

CANADA - FORT MYERS AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	1,380	1,365	2,745	113	0	113	2,858
1972	1,360	1,375	2,735	0	0	0	2,735
1973	1,950	1,870	3,820	0	0	0	3,820
1974	2,580	2,520	5,100	114	127	241	5,341
1975	2,780	2,790	5,570	0	0	0	5,570
1976	3,890	3,590	7,480	238	240	478	7,958
1977	5,000	4,870	9,870	181	192	373	10,243
1978	6,890	6,560	13,450	0	0	0	13,450
1979	8,830	8,540	17,370	0	3	3	17,373
1980	11,510	11,070	22,580	1,036	923	1,959	24,539
1981	11,940	11,910	23,850	2,507	2,479	4,986	28,836
1982	10,880	10,940	21,820	4	4	8	21,828
1983	13,230	12,970	26,200	0	0	0	26,200
1984	14,040	13,760	27,800	7,776	8,888	16,664	44,464
1985	10,770	10,410	21,180	16,239	17,166	33,405	54,585
1986	11,930	11,640	23,570	22,262	22,491	44,753	68,323
1987	13,980	13,350	27,330	22,064	21,291	43,355	70,685
1988	13,430	12,760	26,190	21,813	21,989	43,802	69,992
1989	12,400	12,090	24,490	33,049	33,981	67,030	91,520
1990	14,560	14,410	28,970	45,022	44,825	89,847	118,817
1991	13,870	13,640	27,510	42,665	43,068	85,733	113,243
1992	17,700	17,290	34,990	43,368	43,594	86,962	121,952

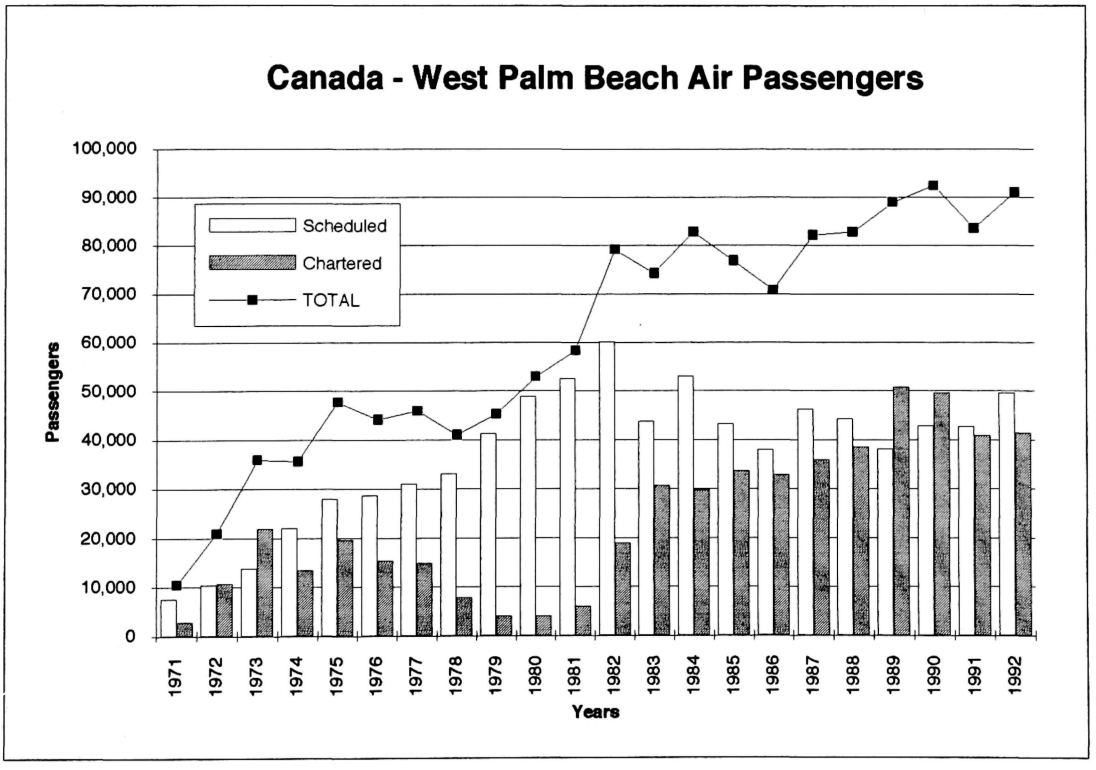


Graphical Representation of Annual Canada - Ft. Myers Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - West Palm Beach Enplanements and Deplanements

CANADA - WEST PALM BEACH AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	3,900	3,665	7,565	1,516	1,359	2,875	10,440
1972	5,330	5,085	10,415	5,472	5,196	10,668	21,083
1973	6,985	6,915	13,900	11,440	10,579	22,019	35,919
1974	11,760	10,430	22,190	7,070	6,377	13,447	35,637
1975	14,790	13,210	28,000	9,830	9,806	19,636	47,636
1976	14,550	14,070	28,620	7,685	7,790	15,475	44,095
1977	16,320	14,660	30,980	7,514	7,423	14,937	45,917
1978	17,080	16,030	33,110	3,927	3,903	7,830	40,940
1979	20,860	20,450	41,310	2,106	1,924	4,030	45,340
1980	24,890	23,970	48,860	2,318	1,726	4,044	52,904
1981	26,520	25,960	52,480	3,092	2,877	5,969	58,449
1982	30,210	29,930	60,140	9,932	9,087	19,019	79,159
1983	22,080	21,630	43,710	15,137	15,491	30,628	74,338
1984	26,610	26,460	53,070	15,237	14,522	29,759	82,829
1985	21,730	21,490	43,220	16,734	16,894	33,628	76,848
1986	19,210	18,790	38,000	15,971	16,915	32,886	70,886
1987	23,330	22,980	46,310	18,206	17,628	35,834	82,144
1988	22,200	22,050	44,250	19,320	19,261	38,581	82,831
1989	19,020	19,080	38,100	26,262	24,603	50,865	88,965
1990	21,520	21,350	42,870	24,916	24,706	49,622	92,492
1991	21,360	21,300	42,660	21,038	19,841	40,879	83,539
1992	24,820	24,800	49,620	20,151	21,264	41,415	91,035

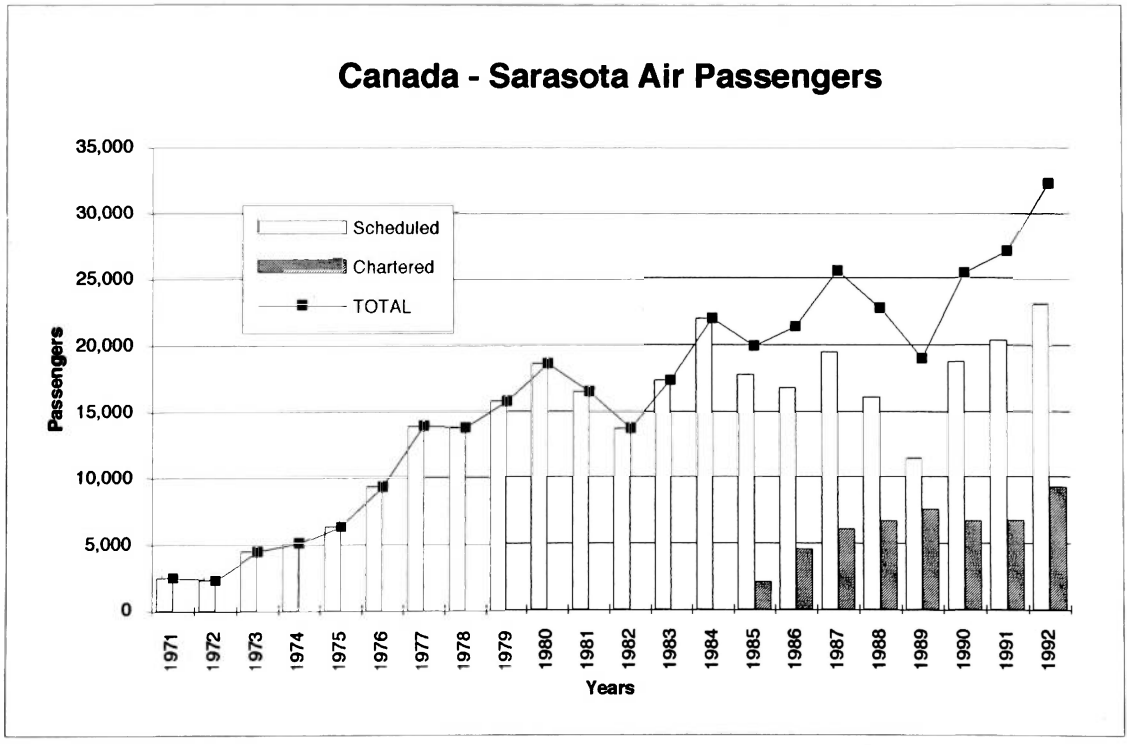


Graphical Representation of Annual Canada - West Palm Beach Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Sarasota Enplanements and Deplanements

CANADA - SARASOTA AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	1,310	1,245	2,555	0	0	0	2,555
1972	1,205	1,145	2,350	0	0	0	2,350
1973	2,330	2,050	4,380	0	0	0	4,380
1974	2,510	2,520	5,030	0	0	0	5,030
1975	3,270	3,040	6,310	0	0	0	6,310
1976	4,780	4,460	9,240	0	0	0	9,240
1977	7,150	6,700	13,850	0	45	45	13,895
1978	7,000	6,720	13,720	0	0	0	13,720
1979	7,800	7,950	15,750	0	6	6	15,756
1980	9,320	9,290	18,610	0	0	0	18,610
1981	8,200	8,260	16,460	0	0	0	16,460
1982	6,900	6,790	13,690	0	3	3	13,693
1983	8,680	8,680	17,360	0	0	0	17,360
1984	11,070	10,900	21,970	0	0	0	21,970
1985	8,990	8,790	17,780	979	1,128	2,107	19,887
1986	8,470	8,320	16,790	2,162	2,377	4,539	21,329
1987	9,940	9,520	19,460	2,942	3,111	6,053	25,513
1988	8,150	7,930	16,080	3,276	3,379	6,655	22,735
1989	5,770	5,650	11,420	3,701	3,840	7,541	18,961
1990	9,360	9,370	18,730	3,312	3,355	6,667	25,397
1991	10,120	10,190	20,310	3,328	3,387	6,715	27,025
1992	11,510	11,540	23,050	4,602	4,634	9,236	32,286

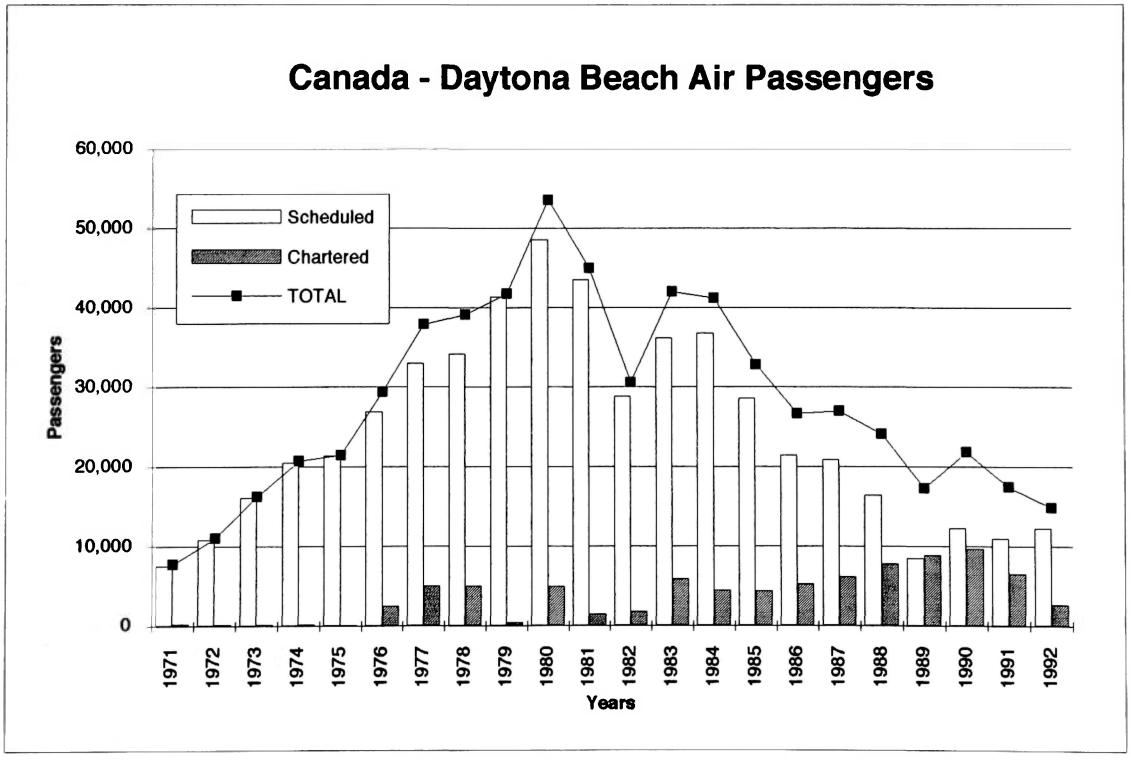


Graphical Representation of Annual Canada - Sarasota Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Jacksonville Enplanements and Deplanements

CANADA - DAYTONA BEACH AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	3,955	3,495	7,450	136	135	271	7,721
1972	5,510	5,295	10,805	99	98	197	11,002
1973	8,100	7,935	16,035	94	94	188	16,223
1974	10,820	9,650	20,470	0	197	197	20,667
1975	11,160	10,190	21,350	79	0	79	21,429
1976	14,150	12,710	26,860	1,266	1,247	2,513	29,373
1977	17,570	15,380	32,950	2,574	2,450	5,024	37,974
1978	17,450	16,690	34,140	2,418	2,603	5,021	39,161
1979	20,960	20,430	41,390	298	119	417	41,807
1980	24,360	24,190	48,550	2,371	2,549	4,920	53,470
1981	22,110	21,420	43,530	750	750	1,500	45,030
1982	14,510	14,260	28,770	942	824	1,766	30,536
1983	18,160	18,000	36,160	3,059	2,817	5,876	42,036
1984	18,560	18,260	36,820	2,180	2,222	4,402	41,222
1985	14,430	14,090	28,520	2,100	2,218	4,318	32,838
1986	10,960	10,480	21,440	2,446	2,763	5,209	26,649
1987	10,720	10,160	20,880	3,146	2,952	6,098	26,978
1988	8,240	8,120	16,360	3,817	3,876	7,693	24,053
1989	4,320	4,100	8,420	4,179	4,626	8,805	17,225
1990	6,110	6,070	12,180	4,928	4,738	9,666	21,846
1991	5,440	5,460	10,900	3,436	3,084	6,520	17,420
1992	6,250	5,920	12,170	1,297	1,375	2,672	14,842

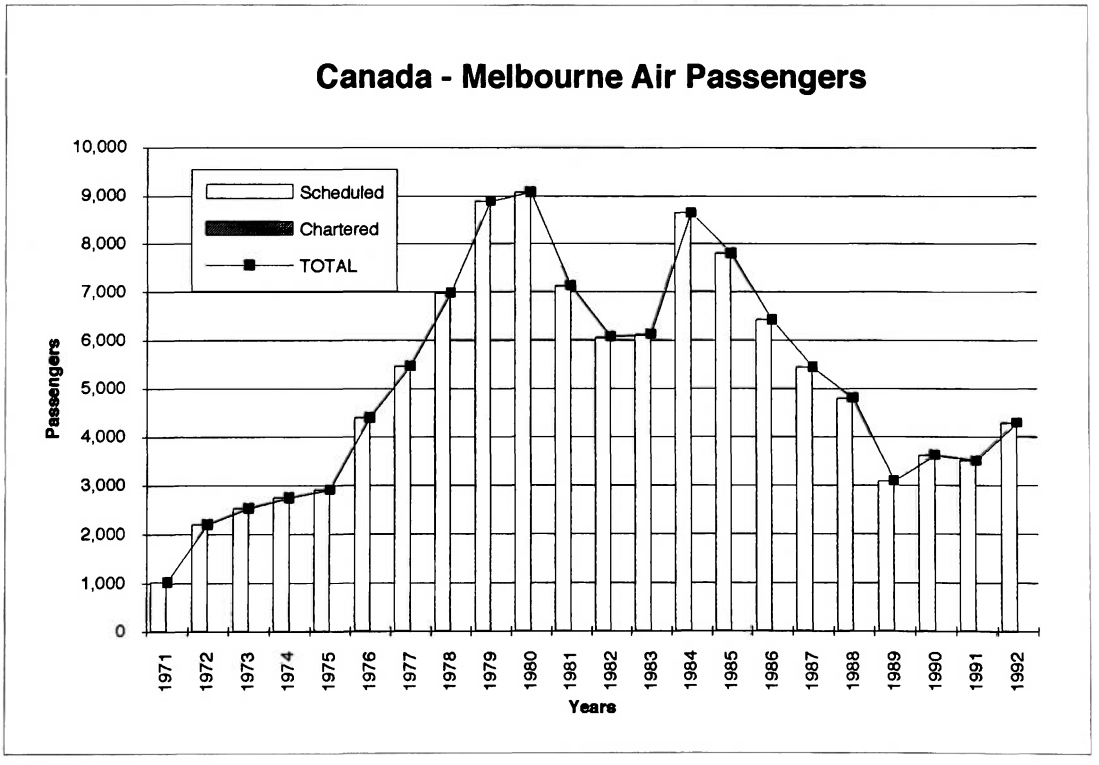


Graphical Representation of Annual Canada - Jacksonville Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Daytona Beach Enplanements and Deplanements

CANADA - MELBOURNE AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	530	495	1,025	0	0	0	1,025
1972	1,150	1,050	2,200	0	0	0	2,200
1973	1,390	1,150	2,540	0	0	0	2,540
1974	1,420	1,320	2,740	0	0	0	2,740
1975	1,390	1,510	2,900	0	0	0	2,900
1976	2,150	2,240	4,390	0	0	0	4,390
1977	2,700	2,760	5,460	0	0	0	5,460
1978	3,480	3,500	6,980	0	0	0	6,980
1979	4,440	4,450	8,890	0	0	0	8,890
1980	4,490	4,580	9,070	0	0	0	9,070
1981	3,620	3,500	7,120	0	0	0	7,120
1982	3,010	3,050	6,060	0	6	6	6,066
1983	3,070	3,050	6,120	0	0	0	6,120
1984	4,290	4,360	8,650	0	0	0	8,650
1985	3,800	4,010	7,810	0	0	0	7,810
1986	3,210	3,220	6,430	0	0	0	6,430
1987	2,780	2,670	5,450	0	0	0	5,450
1988	2,470	2,330	4,800	0	0	0	4,800
1989	1,590	1,500	3,090	2	0	2	3,092
1990	1,800	1,810	3,610	0	0	0	3,610
1991	1,850	1,660	3,510	0	0	0	3,510
1992	2,180	2,110	4,290	0	0	0	4,290

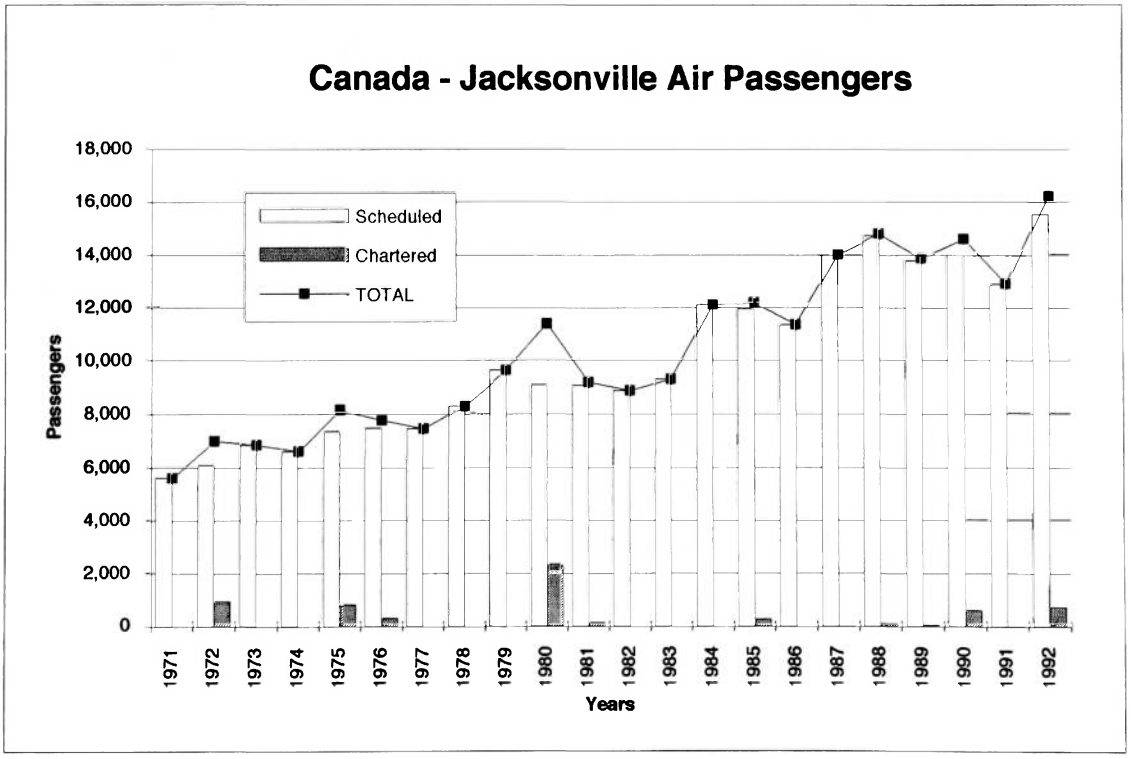


Graphical Representation of Annual Canada - Daytona Beach Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

Annual Canada - Melbourne Enplanements and Deplanements

CANADA - JACKSONVILLE AIR PASSENGER MARKET							
	SCHEDULED PASSENGERS			CHARTERED PASSENGERS			
Year	Inbound	Outbound	Total Scheduled	Inbound	Outbound	Total Chartered	COMBINED TOTAL
1971	2,925	2,670	5,595	0	0	0	5,595
1972	3,095	2,960	6,055	461	453	914	6,969
1973	3,490	3,320	6,810	0	0	0	6,810
1974	3,520	3,050	6,570	0	0	0	6,570
1975	3,680	3,640	7,320	396	396	792	8,112
1976	3,810	3,620	7,430	141	146	287	7,717
1977	3,940	3,480	7,420	0	0	0	7,420
1978	4,290	3,990	8,280	0	0	0	8,280
1979	4,660	4,950	9,610	3	3	6	9,616
1980	4,610	4,450	9,060	1,155	1,149	2,304	11,364
1981	4,460	4,570	9,030	62	62	124	9,154
1982	4,510	4,310	8,820	0	0	0	8,820
1983	4,650	4,610	9,260	4	3	7	9,267
1984	5,990	6,130	12,120	2	2	4	12,124
1985	5,980	5,960	11,940	122	122	244	12,184
1986	5,600	5,740	11,340	0	0	0	11,340
1987	7,060	6,950	14,010	5	19	24	14,034
1988	7,420	7,270	14,690	75	16	91	14,781
1989	6,770	7,000	13,770	78	0	78	13,848
1990	6,890	7,110	14,000	244	329	573	14,573
1991	6,420	6,450	12,870	0	23	23	12,893
1992	7,820	7,710	15,530	347	362	709	16,239



Graphical Representation of Annual Canada - Melbourne Enplanements and Deplanements

Source: Statistics Canada, *Air Passenger Origin and Destination, Canada - US Report* and *Air Charter Statistics*

APPENDIX B

ROUTE ALLOCATIONS CONTAINED WITHIN THE AIR TRANSPORT AGREEMENT, AMENDMENT, AND NOTES SIGNED BY CANADA AND THE US

Air Routes Allocated Within the Air Transport Agreement Signed by Canada and the US in 1966

Source: *United States Treaties and Other International Agreements 1966*

Air Routes Allocated to US Air Carriers

1) Seattle - Vancouver
2) Los Angeles / San Francisco - Vancouver
3) Denver / Great Falls - Calgary
4) Chicago - Toronto
5) Detroit - Toronto
6) Tampa / Miami - Toronto
7) Tampa / Miami - Montréal
8) Los Angeles - Toronto
9) New York - Montréal / Ottawa
10) New York - Toronto
11) Boston - Montréal
12) Washington - Ottawa / Montréal
13) Buffalo - Toronto
14) Minneapolis - Winnipeg
15) United States - Gander - Europe and beyond
16a) Spokane - Calgary
16b) Duluth / Superior - Ft. William / Port Arthur
16c) Ketchikan - Prince Rupert
16d) Fairbanks - Whitehorse
16e) Juneau - Whitehorse
16f) Erie - Toronto

Air Routes Allocated to Canadian Air Carriers

1) Victoria - Seattle
2) Vancouver - San Francisco
3) Halifax - Boston / New York
4) Montréal / Toronto - Chicago
5) Toronto - Cleveland
6) Toronto - Los Angeles
7) Toronto - Tampa / Miami
8) Montréal - Tampa / Miami
9) Montréal - New York
10) Toronto - New York
11) Canada - Honolulu - Australasia and beyond
12a) Prince Rupert - Ketchikan
12b) Whitehorse - Fairbanks
12c) Whitehorse - Juneau

Air Routes Allocated Within the Air Transport Agreement Amendment Signed by Canada and the US in 1974

Source: *United States Treaties and Other International Agreements 1975*

Air Routes Allocated to US Air Carriers

A. Atlantic States Routes
1) Boston - Montréal
2) Boston - Toronto
3) New York - Montréal / Ottawa
4) New York - Toronto
5) Albany / Burlington - Montréal
6) Philadelphia - Montréal
7) Philadelphia - Toronto
8) Pittsburgh - Toronto
9) Washington - Ottawa / Montréal
10) Tampa / Miami - Montréal
11) Tampa / Miami - Toronto

B. Great Lakes - East Routes
1) Buffalo / Rochester - Montréal
2) Buffalo / Toronto
3) Erie - Toronto
4) Cleveland - Montréal
5) Cleveland - Toronto
6) Detroit - Montréal
7) Milwaukee / Detroit - Toronto
8) Chicago - Montréal
9) Chicago - Toronto
10) Duluth / Superior - Thunder Bay

C. Great Lakes - West Routes
1) Rochester - Toronto
2) Chicago / Minneapolis / St. Paul - Winnipeg / Edmonton - Anchorage
3) Milwaukee / Duluth / Superior - Winnipeg
4) Chicago - Vancouver

D. Great Plains Routes
1) Houston / Dallas / Ft. Worth - Calgary / Edmonton - Anchorage / Fairbanks
2) Houston / Dallas / Ft. Worth - Toronto / Montréal
3) Denver / Great Falls - Calgary / Edmonton
4) Bismarck / Minot - Winnipeg

E. Transcontinental Routes
1) Los Angeles - Toronto / Montréal
2) San Francisco - Toronto / Montréal

F. Pacific States Routes
1) Los Angeles / San Francisco - Vancouver
2) Los Angeles - Calgary / Edmonton
3) San Francisco - Calgary / Edmonton
4) Las Vegas - Calgary / Edmonton
5) Spokane - Calgary / Edmonton
6) Spokane - Vancouver
7) Seattle - Vancouver
8) Ketchikan - Prince Rupert
9) Juneau - Whitehorse
10) Fairbanks - Whitehorse
11) Fairbanks - Inuvik
12) Honolulu - Vancouver

G. Intercontinental Routes
1) United States - Gander - Europe and beyond

Air Routes Allocated to Canadian Air Carriers

A. Atlantic Provinces Routes
1) Sydney - Boston
2) Halifax - Boston / New York
3) Halifax - Bangor / Portland - Montréal

B. Québec Routes
1) Québec - New York
2) Montréal - Boston
3) Montréal - New York
4) Montréal - Tampa / Miami
5) Montréal - Cleveland
6) Montréal / Toronto - Chicago

C. Ontario Routes
1) Toronto - Boston
2) Toronto - New York
3) Toronto - Tampa / Miami
4) Toronto / Hamilton - Pittsburgh
5) Toronto - Cleveland
6) Toronto - Dallas / Ft. Worth / Houston

D. Prairie Provinces Routes
1) Regina / Winnipeg - Chicago
2) Calgary / Winnipeg - New York
3) Calgary - Chicago
4) Edmonton / Calgary - San Francisco
5) Edmonton / Calgary - Los Angeles

E. Transcontinental Routes
1) Montréal / Toronto - San Francisco
2) Montréal / Toronto - Los Angeles

F. British Columbia / Yukon Routes

1) Vancouver / Victoria - Seattle
2) Vancouver - San Francisco / Los Angeles
3) Prince Rupert - Ketchikan
4) Whitehorse - Fairbanks
5) Whitehorse - Juneau

G. Intercontinental Routes

1) Canada - Honolulu - Australasia and beyond

Air Routes Agreed Upon Within the 1981 Notes Amending the Air Transport Agreement Between Canada and the US

Source: *United States Treaties and Other International Agreements 1981*

Amend the 1974 Amendment to the Air Transport Agreement to include a new route for US air carriers numbered

A.
3b) New York - Ottawa

The present A. 3 route will be renumbered

A.
3a) New York - Montréal / Ottawa