Elasticity of small aircraft use with changing fuel costs—I love flying my small plane

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Introduction

General Aviation (GA) covers the "operation of aircraft(s) by individuals, companies or government entities for purposes other than commercial passenger and/or cargo transport for remuneration including recreational, business, aerial work and instructional flying"[1]. Fuel price is a major cost item in the operating cost for an aircraft, therefore fuel price increases have been cited as one of the factors influencing the decline of number of operations in some GA airports in the United States[2].

This paper will examine the possible relationship between the price of fuel and small aircraft use (less than 2 000 kg maximum takeoff weight) at General Aviation airports in close proximity to large Canadian urban centers. The purpose of the study is to see if there is a higher elasticity in small private aircraft use as compared to small commercial aircraft use given changing fuel costs.

Four major Canadian GA airports (Springbank Airport near Calgary, Buttonville Municipal Airport near Toronto, Saint Hubert Airport near Montreal and Pitt Meadows Airport near Vancouver) are analyzed, covering a period of five years from 2004 to 2008 for the months of May, June, July, August and September, when the traffic is highest.

It was concluded that there are some relationships between the changes in the price of fuel and the changes in the number of small commercial and private aircraft movements, but these are not consistent. It was found that it can be either a positive or a negative relationship and it might be different from one GA airport to another and even for the same airport can be different through time.

Data

Data used for evaluating the fuel prices are the monthly aviation turbo fuel index calculated and published by Statistics Canada as part of the Industrial Product Price Index (IPPI)[3].

The usage of small aircraft is recorded by the number of small aircraft itinerant movements at the specific airports derived from the Aircraft Movement Statistics Survey[4]. Itinerant movements are the movements in which aircraft depart to or arrive from another location or leave the airport circuit. Local movements are movements that remain in the airport circuit and are not included in this analysis.

The movements are grouped by 'private' and 'other commercial' operation types in order to be able to distinguish the possible difference in trends. Private movements involve the aircraft used for private purposes and not for hire and compensation, while 'other commercial' are movements flown by commercial operators but which are not performed by Air Carriers (aircraft operators licensed by the Canadian Transportation Agency to transport persons, mail and/or goods by air). Some examples of other commercial operations are flying schools, agricultural spraying, aerial photography, aerial ambulance, etc.

Springbank Airport, Alberta

Springbank Airport is the busiest General Aviation airport in Alberta, serving the Calgary area, recording 167,105 total aircraft movements in 2008 of which 70,243 were itinerant and 96,862 local[5]. The number of small commercial aircraft itinerant movements varied in the past five years from 2,028 to 3,541 in the busy summer months (Table 1.1) while the number of small private aircraft itinerant movements varied from 871 to 2,225 (Table 1.2). The aviation turbo fuel price index for the Prairie region is presented in Table 1.3.

Table 1.1
Number of small commercial aircraft itinerant movements, Springbank Airport

	May	June	July	August	September
2004	2,340	2,943	2,952	2,370	2,637
2005	3,131	2,100	3,541	2,851	2,398
2006	2,881	2,845	3,144	3,165	2,736
2007	3,014	3,089	3,354	3,024	2,959
2008	2,319	2,028	2,118	2,193	2,042

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

Table 1.2
Number of small private aircraft itinerant movements, Springbank Airport

	May	June	July	August	September
2004	871	1,124	1,195	1,127	1,091
2005	1,435	1,017	1,784	1,417	1,025
2006	1,262	1,306	1,725	1,421	1,373
2007	1,661	1,534	2,225	1,749	1,980
2008	1,336	1,487	1,639	1,582	1,723

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

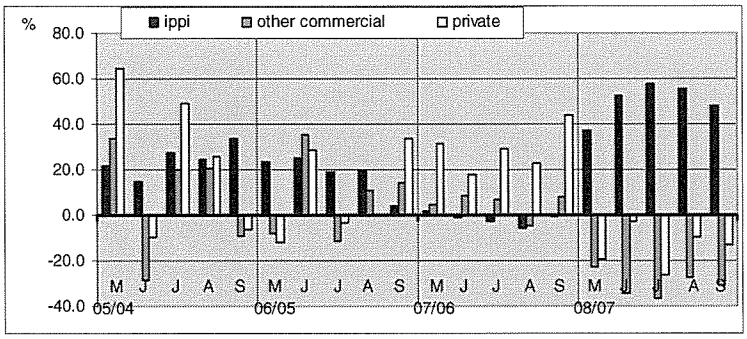
Table 1.3
Aviation turbo fuel monthly price index (1997=100) - Prairie region

	May	June	July	August	September
2004	189.8	199.9	192.8	200.9	200.9
2005	230.7	229.8	246.1	250.4	268.6
2006	285.4	287.3	292.3	299.0	279.8
2007	290.7	283.4	283.5	281.2	278.4
2008	398.4	432.3	447.6	437.8	411.9

Source: Statistics Canada, *Table 329-0047 - Industry price index by regions, monthly (index, 1997=100)*, CANSIM (database).

Figure 1 shows the year-over-year monthly percentage changes in the fuel price index in the Prairie region, as well as in small private aircraft traffic and small commercial aircraft traffic at Springbank for the 2004-2008 period in the months of May, June, July, August and September.

Figure 1
Year-over-year monthly percentage changes in IPPI, commercial movements and private movements, Springbank Airport, Alberta, 2004-2008



It is evident that in 2008 when the price of fuel was very high compared with 2007, both the commercial and private traffic declined but commercial movements appeared to be more affected than the

private flying. In 2007 compared to 2006 (with the exception of the month of May when there was a slight increase in the fuel price) the increase in traffic for private aircraft exceeded the increase in traffic for commercial aircraft. At this airport, for these two time periods, when the price of fuel declined, the private movements responded more than commercial movements but this was not the case when the price of fuel increased. For the periods 2006/05 and 2005/04 it appears that, with the exception of May and July in 2006/05 and June and September in 2005/04, both commercial and private traffic increased even though the price of fuel increased as well.

For the Springbank Airport, there is negative correlation between the price of fuel and small private and commercial aircraft itinerant movements for the 2008/07 and 2007/06 periods but not for the preceding periods of 2006/05 and 2005/04.

Buttonville Municipal Airport, Ontario

Buttonville Municipal Airport is the largest General Aviation airport in Ontario, serving the Toronto area, recording 163,994 total aircraft movements in 2008 of which 80,001 were itinerant and 83,993 local[5]. The number of small commercial aircraft itinerant movements varied in the past five years from 2,764 to 5,025 in the summer months (Table 2.1) while the number of small private aircraft itinerant movements varied from 1,491 to 2,490 (Table 2.2). The aviation turbo fuel price index for the province of Ontario is presented in Table 2.3.

Table 2.1
Number of small commercial aircraft itinerant movements, Buttonville Municipal Airport

	May	June	July	August	September
2004	3,284	4,823	3,977	4,714	4,789
2005	4,143	3,685	4,180	4,127	3,706
2006	3,442	4,247	3,833	4,167	2,764
2007	4,510	4,874	4,739	4,637	4,803
2008	4,575	3,608	4,730	5,025	4,298

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

Table 2.2
Number of small private aircraft itinerant movements, Buttonville Municipal Airport

	May	June	July	August	September
2004	1,625	2,041	1,900	2,245	2,178
2005	1,927	2,011	1,911	1,619	1,771
2006	1,514	1,976	1,713	1,830	1,491
2007	2,490	2,282	2,009	2,082	2,062
2008	1,996	1,724	2,195	2,268	2,077

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

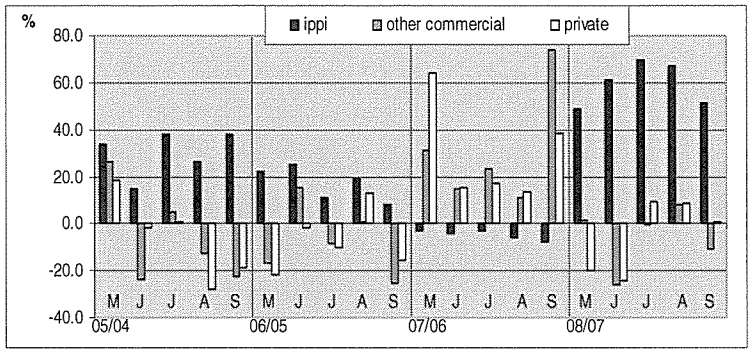
Table 2.3
Aviation turbo fuel monthly price index (1997=100) - Ontario

	May	June	July	August	September
2004	192.0	217.2	200.3	215.5	214.5
2005	256.9	248.9	275.8	272.2	296.4
2006	313.2	310.9	306.2	323.9	320.5
2007	305.0	298.2	298.0	304.1	296.3
2008	453.9	481.3	506.4	508.0	448.3

Source: Statistics Canada, *Table 329-0047 - Industry price index by regions, monthly (index, 1997=100)*, CANSIM (database).

Figure 2 shows the year-over-year monthly percentage changes in the fuel price index in the province of Ontario, as well as in small private and commercial aircraft traffic at Buttonville for the 2004-2008 period in the months of May, June, July, August and September.

Figure 2
Year-over-year monthly percentage changes in IPPI, commercial movements and private movements, Buttonville Municipal Airport, Ontario, 2004-2008



For the year 2008 compared to 2007 even though the price of fuel had increased more than 49% in every one of the months, private movements decreased only in May and June while commercial movements decreased in June and September. In the remaining months, the traffic remained either unchanged or increased slightly. For the period of 2007/06, the increase in both private and commercial traffic strongly exceeded the decrease in fuel price. In the period of 2006/05, with the exception of the months of June when commercial traffic went up and August when private and commercial traffic went up, a decrease in traffic is noticed together with the increase in fuel price. For the 2005/04 period, with the exception of the months of May when commercial and private traffic went up and July when private and commercial traffic registered a slight increase, a decrease in traffic is found together with the increase in fuel price.

For the Buttonville Municipal Airport, it was observed that for most of the periods there is a negative relationship between the change in price of fuel and the change in small aircraft itinerant movements, but not a strong one (except 2007/06).

Pitt Meadows Airport, British Columbia

Pitt Meadows Airport is the largest General Aviation airport in British Columbia, serving the Vancouver area, recording 120,098 total aircraft movements in 2008 of which 41,118 were itinerant and 78,980 local[5]. The number of small commercial aircraft itinerant movements varied in the past five years from 1,042 to 2,108 in the high seasonal months (Table 3.1) while the number of small private aircraft itinerant movements varied from 1,028 to 1,927 (Table 3.2). The aviation turbo fuel price index for the province of British Columbia is presented in Table 3.3.

Table 3.1
Number of small commercial aircraft itinerant movements, Pitt Meadows Airport

	May	June	July	August	September
2004	1,142	1,389	1,323	1,260	1,074
2005	1,470	1,348	1,638	1,717	1,529
2006	1,478	1,748	2,007	1,966	1,914
2007	1,573	1,042	1,500	1,472	1,046
2008	1,616	1,576	1,941	1,753	2,108

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

Table 3.2
Number of small private aircraft itinerant movements, Pitt Meadows Airport

	May	June	July	August	September
2004	1,028	1,157	1,345	1,312	1,064
2005	1,184	1,187	1,384	1,589	1,387
2006	1,193	1,418	1,433	1,630	1,292
2007	1,262	1,280	1,617	1,927	1,507
2008	1,099	1,167	1,377	1,162	1,484

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

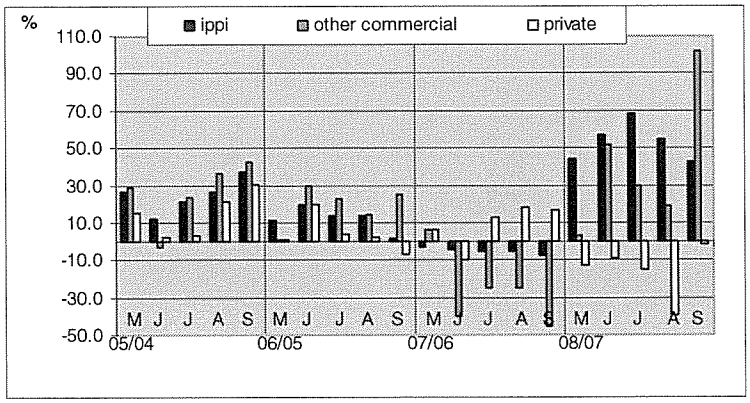
Table 3.3
Aviation turbo fuel monthly price index (1997=100) - British Columbia

	May	June	July	August	September
2004	173.5	181.5	178.2	174.8	178.1
2005	219.3	203.7	216.1	220.7	244.8
2006	244.3	243.9	246.0	250.7	249.0
2007	237.3	233.8	233.4	237.1	231.1
2008	341.1	367.3	393.0	367.2	328.7

Source: Statistics Canada, *Table 329-0047 - Industry price index by regions, monthly (index, 1997=100)*, CANSIM (database).

Figure 3 shows the year-over-year monthly percentage changes in the fuel price index in the province of British Columbia, as well as in small private and commercial aircraft traffic at Pitt Meadows for the 2004-2008 period in the months of May, June, July, August and September.

Figure 3
Year-over-year monthly percentage changes in IPPI, commercial movements and private movements, Pitt Meadows Airport, British Columbia, 2004-2008



An interesting phenomenon can be observed in Pitt Meadows. While prices were very high in 2008 compared with 2007, the commercial traffic went up and private traffic went down while in the 2007/06 period when prices slightly decreased, commercial traffic decreased as well (with the exception of May) and private traffic increased (with the exception of June). For the periods of 2006/05 and 2005/04, the commercial traffic increase exceeded the private traffic increase (the exceptions are commercial traffic in June 2005/04 and private traffic in September 2006/05, which recorded marginal decreases) even though the price of fuel went up.

For the Pitt Meadows Airport, it appears that there is a positive correlation between the change in small commercial aircraft itinerant movements and price of fuel, while the small private aircraft itinerant movements have a negative relationship with change in fuel price for the 2008/07 and 2007/06 periods and a positive one for the 2006/05 and 2005/04 periods.

Saint Hubert Airport, Quebec

Saint Hubert Airport was the busiest General Aviation airport in Canada in 2008, serving the Montreal area, recording 188,369 total aircraft movements in 2008 of which 82,418 were itinerant and 105,951 local[5]. The number of small commercial aircraft itinerant movements varied in the past five years from 1,572 to 3,222 in the summer months (Table 4.1) while the number of small private aircraft itinerant movements varied from 640 to 1,685 (Table 4.2). The aviation turbo fuel price index for the province of Quebec is presented in Table 4.3.

Table 4.1
Number of small commercial aircraft itinerant movements, Saint Hubert Airport

	May	June	July	August	September
2004	2,082	2,410	2,240	2,452	2,400
2005	1,992	2,060	2,459	1,708	1,572
2006	1,660	1,735	1,969	2,336	1,644
2007	2,168	1,923	1,944	2,020	1,877
2008	2,407	1,928	2,591	3,222	2,824

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

Table 4.2
Number of small private aircraft itinerant movements, Saint Hubert Airport

	May	June	July	August	September
2004	1,486	1,659	1,322	1,506	1,685
2005	1,039	1,165	1,038	901	890
2006	723	1,018	1,025	1,173	1,039
2007	1,266	1,168	1,031	904	1,046
2008	889	640	918	988	855

Source: Statistics Canada, Aircraft Movement Statistics special tabulation.

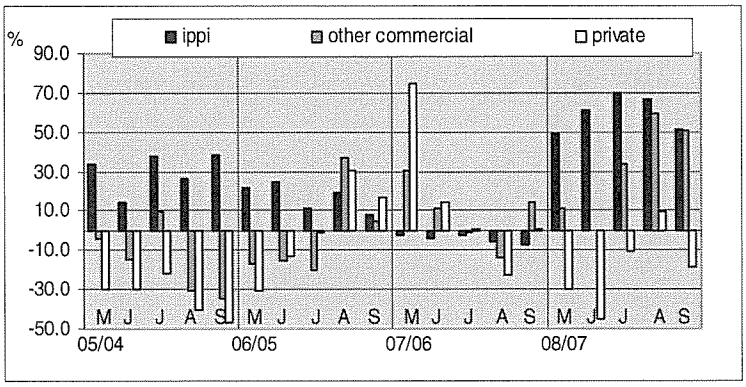
Table 4.3
Aviation turbo fuel monthly price index (1997=100) - Quebec

	May	June	July	August	September
2004	192.0	217.2	200.3	215.5	214.5
2005	256.9	248.9	275.8	272.2	296.4
2006	313.2	310.9	306.2	323.9	320.5
2007	305.0	298.2	298.0	304.1	296.3
2008	453.9	481.3	506.4	508.0	448.3

Source: Statistics Canada, *Table 329-0047 - Industry price index by regions, monthly (index, 1997=100)*, CANSIM (database).

Figure 4 shows the year-over-year monthly percentage changes in the fuel price index in the province of Quebec, as well as in small private and commercial aircraft traffic at Saint Hubert for the 2004-2008 period in the months of May, June, July, August and September.

Figure 4
Year-over-year monthly percentage changes in IPPI, commercial movements and private movements, Saint Hubert Airport, Quebec, 2004-2008



For the 2008/07 period, small commercial aircraft traffic did not seem to be affected by the high fuel prices. On the contrary, with the exception of the month of June, when there was no change registered in the traffic, the number of commercial movements increased. On the other hand the private movements experienced a decrease, with the exception of the month of August. In 2007/06 when the price of fuel registered a small decrease, traffic went down in August while in the other months either it went up or it did not register any changes. In the 2006/05 period, while the price of fuel went up, traffic went down for the months of May, June and July, as opposed to August and September when an increase was observed in traffic. For the 2005/04 period, it seemed that for most of the high season months, both private and commercial movements registered a decrease together with an increase in the price of fuel.

For Saint Hubert Airport, every period analyzed seemed to have a different pattern; some negative correlations between fuel price

change and private and commercial traffic change can be observed in 2005/04, and a positive correlation between fuel price and commercial traffic in 2008/07, while the other periods appear not to have a correlation.

Conclusion

The relationship between the change in price of fuel and the change in small private and commercial aircraft traffic can be positive or negative, can differ from one GA airport to another and even for the same airport can differ through time. Some relationships were found but they were not consistent. This might suggest that fuel price is not necessarily a strong influential factor in the amount of small aircraft itinerant movements. It is possible that other internal and external factors have higher influence on traffic, such as weather and climate, economic situation of the region, development in the region, different population, and different attitudes.

Even when the fuel price is high some of the flight schools are very busy, the increased cost of fuel sometimes being absorbed by the company, or perhaps some higher income students are not strongly affected by the increase[6]. Some other schools such as in the case of Saint Hubert Airport, have an increasing number of contracts with foreign airlines to train their cadets and consequently, the number of flights increase even when the price of fuel is high[7]. On the other hand, the FAA (Federal Aviation Administration) reported that because of high fuel prices some of the GA airports in the United States registered as much as 30% decline in flight activity[8]. Many flying schools also rent their aircraft and the price of renting might not necessarily reflect the increased fuel price, perhaps because the school is covering it, or there might be a small increase in price but not high enough to deter recreational pilots from flying. Some private recreational pilots seem to be changing their habits and flying much less[6, 9] while others, similar to motorists' attitudes, adapt to higher fuel costs for flying and still fly for fun.

It is also possible that schools and private pilots still fly their small aircraft but fly shorter distances or more direct routings and this way they offset the increase in the price of fuel[8, 9]. There have been some reports of pilots switching FBO's (Fixed based operators) to find lower fuel prices[8, 10] which might increase the traffic at an airport with fuel prices lower than other regional airports even if the prices are increasing.

Some airports might be in continuous development due to regional development, increasing population, infrastructure and even though the price of fuel is high the business is growing (Pitt Meadows Airport).[11]

Finally, the price of fuel is a small cost compared with the cost of the capital outlay to purchase aircraft, insurance and maintenance. After this outlay, even a high increase in fuel price may not affect the decision to fly.

Note

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Endnotes

[1] Transport Canada, ECATS Pilot Project, http://www.tc.gc.ca/policy/ecats/genaviation/ga.htm, accessed on March 12, 2009.

[2] Statement of Robert P. Olisagers, Executive Director Arapahoe County Public Airport Authority - Colorado Centennial Airport, before the Committee on Finance, Subcommittee on Energy, Natural Resources and Infrastructure U.S. Senate Concerning Next Generation Air Transportation System Financing Reform Act of 2007, Hearings, July 19, 2007,

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[4] Statistics Canada, Aircraft Movement Statistics, http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=2715&lang=en&db=imdb&adm=8&dis=2, accessed on February 10, 2009.

[5] Statistics Canada, CANSIM database, table 401-0023.

[6] Avion Newspaper, August 8, 2006, "As fuel prices grow, general aviation slows", by Jonathan Hornack, http://media.www.avionnewspaper.com/media/storage/paper798/news/2006/08/08/CampusNews/As.Fuel.Prices.Grow.General.Aviation.Slows-2220822.shtml, accessed on February 7, 2009.

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[11] The Fraser Valley News, January 8, 2009, "Airport Future still idling on political runway; Two councils yet to agree on restructuring 'diamond-in-rough'", by Brian Lewis.