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**CROSS-BORDER TRIPS BY CANADIANS AND AMERICANS  
AND THE DIFFERENTIAL IMPACT OF THE BORDER**

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**ABSTRACT**

Same day automobile trips have been used as a barometer of cross-border shopping between Canada and the United States. The determinants of same day automobile cross-border trips by Canadians and Americans are examined using regression analysis and the results find that key determinants are lagged trips, per capita income, the real exchange rate and seasonal factors. The coefficient on lagged trips is larger for Canada than for the United States suggesting that, over time, Canadians adjust more rapidly to the desired number of trips than Americans. More intriguing is the fact that while income is positive for Canadian same day auto trips to the United States, it is negative for American same day auto trips to Canada. This implies that cross-border trips are normal goods for Canadians but inferior goods for Americans. The Canada-U.S. border is thus viewed differently by residents depending on which side they happen to live on and exercises a differential impact on cross-border trips.

**INTRODUCTION**

The Canada-U.S. border is an international transit zone marked by an extraordinarily high volume of economic activity. One feature of this activity which gained a large amount of attention in the late 1980s and early 1990s was the tremendous surge in cross-border shopping by Canadians in the United States as measured by same day cross-border travel statistics. As shown in Figure 1, starting in 1986, same day automobile trips by Canadians to the United States rose from 25.9 million to reach a peak of 59.1 million in 1991 before declining to 36.3 million in 1996. Cross-border travel is also engaged in by Americans and Figure 1 shows that same day trips by Americans to Canada have generally been lower than Canadian trips to the United States with little discernible upward trend. Indeed, American same day automobile trips to Canada peaked in 1981 and have yet to exceed the record set then of 27.1 million.

In per capita terms, however, Canadians are by far the more frequent cross-border travelers. Over the period 1972 to 1997, they averaged 14 times the number of cross-border same day automobile trips per capita relative to the Americans. This is all the more re-

markable given that the population of the United States is approximately 10 times that of Canada. This remarkable propensity to cross-border travel is still high even if one adjusts U.S. population figures to only include those states that border Canada. At the peak of the cross-border shopping upsurge, Canadians were on a per capita basis making over *30 times* the number of same day cross-border automobile trips to the United States than Americans were making to Canada.

The determinants of same day automobile cross-border trips by both Canadians and Americans is examined using regression analysis and a partial adjustment model. The results find that the key determinants are per capita income, the real exchange rate and seasonal factors. The coefficient on lagged trips is larger for Canada than for the United States suggesting that Canadians adjust more rapidly to the desired number of trips than Americans. More intriguing is the fact that, while income is positive for Canadian same day trips to the United States, it is negative for American same day auto trips to Canada. This implies that cross-border trips are normal goods for Canadians but inferior goods for Americans. The Canada-U.S. border is thus viewed differently by residents depending on which side they live on. All things given, in response to an increase in income, Canadians are likely to make more cross-border trips while Americans make fewer, likely substituting other trips for ones to Canada. The Canada-U.S. border thus exercises a differential impact on cross-border trips.

### **BORDERS, TOURISM AND CROSS-BORDER TRAVEL**

International borders can be defined as “invisible vertical planes that transect the air-

space, the soil and the subsoil between adjoining states, and they mark the limit of territory in which a state can exercise its sovereign authority” (32, p. 525). In essence, a border is an institution and institutions are the arrangements that people have for dealing with one another. Nobel laureate Douglass North (26, p. 201) asserts that “Institutions provide the framework within which human beings interact” and that they are “sets of rules, compliance procedures and moral and ethical behavioral norms designed to constrain the behavior of individuals.” Political-economic systems are institutional arrangements and borders separate such systems and provide zones of formal contact and interaction. Borders can be seen as institutional devices designed to assert and enforce property rights by a nation state over a set geographic space. Given that borders separate differing institutional spaces, it is to be expected that economic behavior as well as other types of behavior will differ across borders (3, 27, 28).

An extensive literature has developed on borders and their impact in economics, geography and tourism research. This literature has grown given the global institutional changes that have been occurring with respect to international trade agreements as well as national integration and disintegration. As Leimgruber (17, p. 53) writes:

The study of boundaries has become very popular with human geographers in the past few years, and this popularity seems to be increasing as the date of the final abolishment of boundaries within the EC approaches (1992).

The establishment of free trade zones and agreements such as the North American Free Trade Agreement and the Canada-U.S. Free Trade Agreement also creates an interest in borders and their impact (31).

Some economists have argued that the establishment of regional trading blocks makes the impact of borders less important for international trade. However, McCallum (19) estimates a model of trade between Canada and the United States and finds that even "the relatively innocuous Canada-U.S. border continues to have a decisive effect on continental trade patterns" and that this suggests that "national borders in general continue to matter." In another study, Engel and Rogers (11) examine the importance of borders and distance on price volatility using Canada and the United States and again find that distance and the presence of the border are significant in explaining price dispersion across different locations. Engel and Rogers (11, p. 1123) conclude that their results also confirm McCallum's that "despite the relative openness of the U.S.-Canadian border, the markets are still segmented."

With respect to tourism, boundaries are often seen as barriers to interaction given the formalities that often need to be observed when crossing, but at the same time they may be regarded as lines of contact (32, p. 531). A border creates a destination by creating a demarcation line to new opportunities. Borders can create different economic and social spaces which spawn the diversity that fuels travel. Moreover, crossing the border itself can be regarded as a tourist attraction as travelers sometimes cross borders "for the sole reason of being able to claim, for reasons of prestige, that they have been in a foreign country" (32, p. 527). In the case of tourism, boundaries between different countries can have different functions which can be listed as a barrier to tourism, as a destination area, as modifiers of the tourist landscape and as transit zones (33).

Boundaries are elements of the cultural landscape and the boundary between Canada and the United States lies at one extreme of

the spectrum of demarcated boundaries being a particularly easy-to-cross border where fairly similar societies meet. The Canada-U.S. border is approximately 4,000 kilometers long with 116 official border crossing points. As Prescott (27, p. 93) writes:

Here the boundary vistas are carefully cut and the boundary monuments kept in good repair even on the more remote western borders. This is largely for reasons of administrative convenience, and not to restrict circulation. Structures to allow the application of state functions are located at the important recognized crossing points. Along such boundaries there is often an absence of permanent fortifications. At the opposite end of the scale there are those boundaries between unfriendly states where the boundary demarcation is maintained in order to prevent circulation and to simplify defence.

The border between Canada and the United States also marks off two different geographic distributions of population which also influences interaction between the two countries. The United States has a much larger population distributed in large nodes throughout its territory each interconnected to the other via a dense network of roads and transport corridors much like interlocking wheels and spokes. Canada, on the other hand is relatively sparsely populated with most of its population strung out along the border in a series of isolated population islands. As one famous Canadian author put it:

On the map Canada looks square; in reality we are another Chile, with ninety-tenths of our people living within two hundred miles of your border, an archipelago of population islands walled

off from each other by the terrifying obstacles of Precambrian rock, muskeg, mountain barriers, storm-tossed waters. (2, pp. 97-98)

This distribution of population suggests that Canadians will often find it easier to interact with Americans across the border than with each other across interprovincial boundaries as opposed to Americans who have a much denser internal market for trade and travel. Indeed, earlier studies have observed that with respect to Canada-U.S. cross-border travel, there are variations both east-west as well as north-south. Regional differences in cross-border travel behavior by Canadians going into the United States are examined by Di Matteo and Di Matteo (8). As Merrit (22, p. 19) notes: "First, cross-boundary traffic is distributed unevenly along the length of the boundary. Second, the pattern of Canadian traffic entering the United States does not mirror the American traffic entering Canada." Canadians are generally more likely to cross the border into the United States than Americans are into Canada.

#### **CANADA-UNITED STATES CROSS-BORDER TRAVEL: AN OVERVIEW OF THE DATA AND ISSUES**

While cross-border shopping between Canada and the United States is not specifically estimated by Statistics Canada, same day automobile trips by Canadians and American as well as the expenditures made by same day automobile travelers have become proxies for cross-border shopping. Some cross-border shopping is also engaged in by Canadians and Americans who make trips of one or more nights but these expenditures can be considered to be driven more by vacation purposes. Same day automobile travel is considered a purer measure of

cross-border shopping. The travel data on same day and one or more nights automobile trips for Canadians and Americans were obtained via Statistics Canada, International Travel Section and are available quarterly from Statistics Canada (Canadian Socio-Economic Information Management System—CANSIM) from 1972 to 1997. The rest of the economic data used in this paper were obtained from Statistics Canada (CANSIM) and the U.S. Department of Labor, Bureau of Labor Statistics. The travel data currently relies on frontier counts and travel surveys. Frontier trip counts were selected by Statistics Canada as the most practical method of collecting tourist statistics because most of Canada's visitors come from the United States (1, p. 565). The trip counts are a census (frontier counts) at all but seven border crossing points where toll bridges exist. (There are 116 border crossing points between Canada and the United States.) A sample method is used at these toll bridge points and crossings at these points account for about one-third of national trip totals. A traveler who enters and leaves the country in less than 24 hours is denoted as a same day traveler while if the traveler makes at least a 24 hour stay he or she is categorized as a one or more nights traveler.

As well, continuous questionnaire surveys are used by Statistics Canada to obtain information on the expenditures and characteristics of international travelers. Statistics Canada conducts a Government Travel Survey of U. S. Visitors to Canada, an International Travel Survey of Canadian Residents, a Canadian Resident Questionnaire for Same Day Automobile Travel Between the U.S. and Canada and a United States Resident Questionnaire for Same Day Automobile Travel Between the U. S. and Canada. These are handed out by customs officials according to pre-arranged schedules. The survey

also asks questions about expenditures made while out of the country such as lodging, food, entertainment, local transportation and all other purchases of personal goods and services.

Given that same day trips are a border count while same day expenditures are calculated via a survey, the number of same day trips is considered to be a more reliable measure of cross-border shopping by Statistics Canada. As Kemp (16, p. 5) writes: "Of the two surveys, the frontier counts are judged to be the more reliable. Most of the data are from a census, are straightforward to collect and form part of the administrative record for the ports of entry. The questionnaire survey is more difficult to evaluate. The sample is scientifically designed to be representative of ports of entry, days of the week and quarters of the year. The results obtained from questionnaires, however, depend on the co-operation of Customs officers and returning travellers." Indeed, research has found that the difference between actual and reported expenditures can sometimes be quite large especially when money is relied upon to recall shopping purchases (13).

Figures 1-3 and Table 1 illustrate the dimensions of same day automobile trip travel between Canada and the United States since 1972. Between 1972 and 1974, Canadians averaged 20.8 million same day automobile trips per year to the United States. This grew to an average of 22.3 million in the period 1975-79 and 23.1 million during 1980-84. There was a surge over the next ten years with an increase to an annual average of 32.3 million during 1985-89 and to 50.9 million between 1990-94 but was then followed by a steep decline to 36.3 million for 1995-96 (see Table 1). During the cross-border shopping surge of 1986-1991, annual growth rates for same day automobile trips to the United States ranged from 14 to 20

percent. The peak year for Canadian same day automobile trips to the United States over the period 1972-1997 was 1991 when 59.1 million trips were taken. Over the entire 1972-1996 period, Canadians averaged 31.3 million same day automobile trips per year with a coefficient of variation of 38.5.

American same day automobile trips to Canada have experienced a much more stable pattern. Over the period 1972-74, they averaged 21.6 million per year, declining to 18.1 million for the period 1975-80 and then rising to 22.6 million over the 1980-84 period. There then followed a gradual ten year decline which brought U.S. same day automobile trips to an annual average of 19.8 million during the 1990-94 period and this was followed by an increase to 23.3 million for 1995-96 (see Table 1). The peak year for American same day automobile trips to Canada was 1981 when 27.1 million trips were made. Indeed the years 1980 and 1981 represented an American cross-border travel incursion into Canada as evidenced by the same day automobile trip figures (see also Figure 1). The year 1980 alone saw a 40 percent increase in same day automobile trips by Americans to Canada but it was then followed by a 25 percent drop in 1982. Over the entire period 1972-1996, Americans averaged 21 million same day automobile trips to Canada per year with a coefficient of variation of 10.8.

On average the period 1972-1996 saw Canadians make 1.5 times the total number of same day trips automobile trips relative to the Americans but this difference is greatly accentuated when per capita figures are examined. Canada has approximately 10 percent of the population of the United States so an examination needs to be made using per capita figures. Figure 2 shows that over the period 1972 to 1996, Americans made well below one same day automobile trip

per capita to Canada and the figure appears relatively stable. Over the period 1972 to 1986, Canadians averaged about 1 trip year but this figure doubled between 1986 and 1991. It has since fallen to near pre-1986 levels. It could be argued that the American per capita figures would be much higher if only the population of border states was used. After all, the Canadian tendency to cross the border is likely provided an added incentive by the fact that 90 percent of Canadians live within 100 kilometers of the border. However, as Figure 2 shows, even an adjusted U.S. population figure including only border area trips shows that American trips were substantially lower per capita than Canadian ones. The U.S. border area states used in Figure 2 are: Washington, Idaho, Montana, North Dakota, Minnesota, Wisconsin, Michigan, Indiana, Ohio, Pennsylvania, New York, Vermont, New Hampshire, Massachusetts and Maine. In 1970, these states accounted for 38 percent of the U. S. population which declined to 35 percent in 1980 and 33 percent in 1990. Interpolation was used to construct these proportions for the intervening years and then applied to construct the U.S. adjusted per capita trips figures used in Figure 2.

There is indeed differential behavior between Canadians and Americans when it comes to cross-border travel. As Figure 3 shows, between 1972 to 1986, Canadians took approximately ten times the number of per capita same day automobile trips than Americans. This figure rose to about 30 times by 1991 but has declined since. The gap narrows substantially if only the U.S. border area state population is used but these results nevertheless suggest that Canadians have a much higher tendency to cross the border into the United States than Americans do into Canada. This suggests that there may be a differential view of the border as well as a differential responsiveness

to economic variables determining travel across Canada and the United States. While the Canadian proclivity to cross the border has been relatively constant over time it achieved an even larger profile during the cross-border shopping phenomenon of 1986-1991.

Given the negative impact of cross-border shopping on Canadian border retailers, a great deal of interest and study has been expended on explaining the surge of Canadian cross-border trips that occurred between 1986 and 1991. At the peak of the phenomenon in 1991, it is estimated that Canadian same day automobile trip makers spent \$1.8 billion dollars Canadian in the United States. The impact of cross-border spending was more significant in terms of jobs lost in retail if one accepts the proposition that the official figures underestimated the value of goods which actually crossed the border and the fact that the jobs losses were concentrated in border cities. An Ontario study estimated that in 1991, cross-border shopping would drain \$2.2 billion dollars and 14,000 jobs from the Ontario economy. (5, p. 2; 24).

A variety of popular reasons have been suggested for the cross-border travel and shopping phenomenon particularly with regards to the behavior of Canadians (30, p. 8-15; 34, p. 24-36). Lower prices of goods, especially for gasoline, cigarettes, alcohol, poultry and dairy products have been cited as an important factor in driving Canadians south to spend their money. Studies have found the Canadian retail sector to have higher distribution costs which are then passed onto the consumer. A report released in May 1992 by the National Task Force on Cross-Border Shopping prepared by Ernst and Young Management Consultants, argued that Canada's distribution system was inefficient, led to higher prices and was a cause

of cross-border shopping. In addition, some have gone so far as to blame the media for magnifying the cross-border shopping phenomenon by constantly reporting on it. The New Brunswick Chamber of Commerce's final report on cross-border shopping (23, p. 11) stated that "People seemed unanimous in saying that the media have contributed to the phenomenon of cross-border shopping by making this question a daily headline."

Higher Canadian taxes, in general, have been blamed for raising the cost of Canadian goods to the point where Canadians have been participating in a tax revolt by shopping elsewhere. A study by the Canadian Federation on Independent Business (4) argued that Canadian retailers were at a serious disadvantage compared to their U.S. counterparts because of the tax system. A comparison between Buffalo and Toronto retailers showed the tax burden for a small Buffalo retailer was 50 to 70 percent that of a small Toronto retailer. The onset of the Goods and Services Tax in 1991 has been blamed for the surge in trips that has occurred since 1990. The Goods and Services Tax is a Federal sales tax levied at the retail level at a rate of 7% and which replaced the previously hidden Manufacturer's Sales Tax.

The exchange rate has also been blamed for cross-border shopping because of the appreciation of the Canadian dollar since 1986. Whereas in 1986 the Canadian dollar stood at approximately 72 cents U.S., by 1991, it reached 88 cents, a 22% appreciation with trips rising during this period from 25.9 to 59.1 million. Between 1991 and 1996, Canadian same day automobile trips to the United States dropped by 39 percent while the average value of the dollar fell from about 88 cents U.S. to approximately 70 cents. On the other hand, during the same period, American same day automobile trips

to Canada increased by 20 percent. Econometric studies of national cross-border shopping have found that per capita income, the exchange rate, the ratio of Canadian to U.S. gasoline prices, the onset of the Goods and Services Tax and seasonal variation have all been statistically significant variables affecting the level of cross-border shopping (7, 8, 9).

To a certain extent, one could view all these factors in a push-pull framework (10, 18). Push factors are forces that urge people towards a destination while pull factors are external forces that draw people towards a destination. Perceived higher costs of goods in Canada, lack of selection and choice and the onset of the Goods and Services Tax could all be viewed as factors pushing Canadians across the border. On the other hand, the presence of alternate shopping facilities in American/Canadian border cities and favorable exchange rate could be viewed as factors pulling Canadians into the United States or Americans into Canada.

The decline in Canadian cross-border shopping activity that began in 1992 is not at all surprising given these aforementioned variables and factors. Canadian per capita personal income has been flat since the recession began in 1990 and the Canadian dollar has depreciated substantially. The decline in the Canadian dollar has no doubt helped fuel the increases in American same day trips to Canada which have occurred since 1993. Moreover, there have been a number of developments which may also have affected cross-border trips and spending. Canada Customs increased the number of customs officers stationed at main border points and introduced a computer system to speed up calculation and payment of duty. As well, there have been changes in Canada's retailing structure with the arrival of U.S. style discount retailers such as the Price Club and



Costco. There is a general perception that Canadian retailers have become a little more competitive. These changes in retailing are likely to continue with the arrival of Wal-Mart. Finally, some measures have been taken by Canadian governments in an attempt to stem the flow but, aside from increased vigilance at the border, they have mostly been in the form of moral suasion.

## MODEL AND ESTIMATION

### Modeling Cross-Border Trips

The explanations of cross-border shopping cited in the data overview provide guidance as to the variables to be included in an economic model of the determinants of same day automobile cross-border travel. Previous work on Canadian cross-border trips and expenditures (7, 8, 9) modeled the demand for trips and expenditures based on the substantial literature on the econometric modeling of the demand for tourism trips and expenditures and the economics of tourism. This work uses consumer demand theory to generate single equation models which examine how tourist expenditures or the number of visits respond to the main determinants of demand such as price and income.

A simple economic model of the demand for cross-border travel and shopping can be constructed in which a representative consumer derives utility ( $U$ ) from the consumption of a composite locally purchased good ( $L$ ) and a composite good purchased across the border ( $C$ ) as shown in (1):

$$(1) U=U(L,C)$$

The consumer seeks to maximize utility from the consumption of these two goods subject to the following budget constraint:

$$(2) P_L L + EP_C C = Y$$

where  $P_L$  is the price of the local good,  $P_C$  is the price of the cross-border good,  $E$  is the exchange rate and  $Y$  is the consumer's income. The maximization process yields a demand function for  $C$  in which  $C$  is a function of the real exchange rate and real income:

$$(3) C = C(EP_C/P_L, Y/P_L)$$

For estimation purposes, this general expression can be operationalized as:

$$(4) C = a_0 + a_1 EP_C/P_L + a_2 Y/P_L + a_N Z_N$$

where  $a_0$ ,  $a_1$ ,  $a_2$  and  $a_N$  are the parameters to be estimated and  $Z_N$  is a vector of exogenous variables to account for factors other than income or the real exchange rate that could also influence the demand for cross-border shopping.

This model is not completely satisfactory because in many ways, cross-border travel is a dynamic process that occurs over time in response to economic incentives and stimuli and therefore some way of modeling this adjustment process is desirable. For example, the response to a change in income and exchange rates will require some time to have its effects filtered down to the traveling public. The short term changes in travel are therefore going to be smaller than the longer term changes under full adjustment. One way of capturing this type of adjustment behavior is via a partial adjustment model (14, pp. 349-351).

We begin by assuming that the optimal or desired number of cross-border trips in the long run  $C^*$  is a function of the real exchange rate  $R$ , real per capita income  $Y$  and assorted exogenous factors  $Z$  as in (4) but written as:

$$(5) C_t^* = a_0 + a_1 R_t + a_2 Y_t + a_N Z_t$$

We do not expect that actual cross border trips  $C_t$ , adjust completely to the exogenous variables in period  $t$  but instead to approach it gradually over time with the gap a function of an adjustment parameter which we shall term  $\lambda$  where  $0 \leq \lambda \leq 1$ . The larger the value of  $\lambda$  the more rapid the adjustment. Thus the gap between this period's cross-border trips and last period's cross-border trips is a function of the gap between desired trips  $C_t^*$  and last period's trips  $C_{t-1}$ . We can express this as:

$$(6) C_t - C_{t-1} = (1-\lambda)(C_t^* - C_{t-1})$$

If we substitute in the terms for  $C_t^*$  from (5), we obtain the following expression which can then be used for estimation purposes:

$$(7) C_t = (1-\lambda)a_0 + \lambda C_{t-1} + (1-\lambda)a_1 R_t + (1-\lambda)a_2 Y_t + (1-\lambda)a_N Z_t$$

In order to obtain elasticities, we could re-express the above equation in log-log form as:

$$(8) c_t = (1-\lambda)\alpha + \lambda c_{t-1} + (1-\lambda)a_1 r_t + (1-\lambda)a_2 y_t + (1-\lambda)a_N z_t$$

where  $c_t$  is the natural log of  $C_t$ , etc. The coefficients are now elasticities or the responsiveness of one variable to another. The elasticity of  $y$  with respect to  $x$  is the percentage change in  $y$  given a 1 percent change in  $x$ . For example, an elasticity of 2 means that a 1 percent change in  $x$  results in a 2 percent change in  $y$ . The short run elasticity of cross-border trips with respect to income is  $(1-\lambda)a_2$  while in the long run, given the estimated adjustment parameter  $\lambda$ , the estimated long run elasticity would be  $(1-\lambda)a_2/(1-\lambda)$  which is simply  $a_2$ . Note that if  $\lambda$  is equal to 0, which implies full and immediate adjustment, the partial adjustment model reduces to our original model in (5).

It should be noted that there are alternate approaches to time series based on the issue of stationarity. A stationary time series is one whose mean and variance does not change with time. That is, there is no trend upward or downward over time. If variables in a regression are non-stationary, then the implication is that any of the positive correlations among the variables in regression may be spurious. In such a situation, if the error term is stationary, then the two variables are cointegrated and they exhibit a long term relationship with the error term representing short term deviations from that relationship. Spurious regressions are a potential problem and can be detected by regression results that exhibit a low Durbin-Watson statistic. Tests for stationarity are available but their power is limited by both the quality and time span of the data (12, pp. 339-342; 15, pp. 250-254).

### Estimation and Results

The variables used in the regressions are summarized in Table 2 and the results are presented in Table 3. In the first regression a log-log model is specified which regresses per capita Canadian same day automobile trips to the U.S. (CSDATC) on Canadian real per capita personal disposable income (CRPDIC), the real exchange rate (REXCH) expressed in Canadian dollars per U.S. dollars (that is, as the real exchange rate rises, the Canadian dollar depreciates relative to the U.S. dollar), a gasoline price index variable (EGASRAT) equal to the exchange rate adjusted ratio of U.S. to Canadian gasoline prices, quarterly seasonal dummies (Q1-Q3) with the fourth quarter omitted and a step dummy for the Goods and Services Tax (GST) which was introduced in 1991. A dummy variable for the Free Trade Agreement (FTA) between Canada and the United States which took effect in 1989 was included in the original specification. It has

been suggested that the gradual elimination of cross-border tariff barriers over a 10 year period may have been interpreted by some Canadians as an invitation to go shopping in the United States. Although the variable was positive and significant it introduced a potential multicollinearity problem as it was very highly correlated with the GST and the gas price variable and was subsequently dropped from the regression.

In the second regression, a log-log model is specified which regresses per capita U.S. same day automobile trips to Canada (US-DATC) on U.S. real per capita personal disposable income (URPDIC), the real exchange rate and quarterly seasonal dummies. Initial specifications also included the gasoline price index variable but it was found not to be statistically significant and was omitted from the final specification. Initial specifications also included the FTA and GST but they were also not statistically significant. Both regressions also include the dependent variable lagged one period which provides us with the estimate of the partial adjustment parameter.

The results are presented in Table 3. Canadian per capita same day automobile trips to the United States are positively and significantly related to lagged trips and real per capita income and negatively and significantly related to the real exchange rate and the exchange rate adjusted gasoline prices. All significances are at the 5 percent level unless otherwise stated. No correction was made for serial correlation. The onset of the GST has a positive effect on trips to the United States though the result is only significant at the 10 percent level. Seasonality also plays an important role with trips being significantly higher in all quarters relative to the fourth quarter (October-December) and the strongest positive effects are in the sec-

ond and third quarters (that is, Spring and Summer).

American per capita same day automobile trips are positively and significantly related to the lagged trips and the real exchange rate (i.e., as the Canadian dollar depreciates, U.S. trips increase) and negatively and significantly related to real per capita income. As well, there are seasonal differences which parallel the Canadian results. Relative to the fourth quarter, American cross-border trips are significantly higher in the other quarters but the effect is strongest in the second and third quarters.

Per capita income, the real exchange rate, lagged trips and seasonal factors are important determinants of same day automobile trips on both sides of the border. As well, gasoline prices and the GST are important additional influences for Canadian cross-border travelers but not for American ones. However, there are important differences in the effect of these variables on cross-border travelers in Canada and the United States. First, the coefficient on lagged trips is larger for Canada than the United States. This implies that Canadians adjust much more rapidly to economic factors that influence the level of cross-border trips. This suggests that Canadians are more aware of opportunities across the border and can act more quickly to take advantage of them. This is perhaps not unexpected given that 90 percent of Canadians live within 100 kilometers of the American border.

With respect to the exchange rate, Canadians are again much more sensitive to the exchange rate than Americans. Moreover, when one calculates the long run elasticities, the absolute value of the exchange rate elasticity is 1.81 for Canadian same day auto trips to the United States and 0.89 for American trips to Canada. The short run

elasticities are the coefficients as the model is estimated using log-log specification. The Canadian short run (that is the immediate impact in one quarter) real exchange rate elasticity is -0.55. The long run exchange rate elasticity for Canadian same day automobile trips is equal to the coefficient on the real exchange divided by one minus the coefficient on lagged trips. The calculation is:  $[-0.5501/(1-0.6967)]=-1.81$ . An equivalent calculation is performed for the U. S. regression results.

What this means is that a 1 percent depreciation in the real exchange rate between the Canadian and U.S. currencies will increase American same day trips by about nine-tenths of one percent and will reduce Canadian trips by 1.8 percent. Again, this suggests that there is a cross-border difference in behavior. Canadians are much more sensitive to fluctuations in the value of the exchange rate than Americans. Moreover, the results suggest that given the current depreciation of the Canadian dollar relative to the American one, Canadian trips will decline quite dramatically whereas American same day automobile trips to Canada will not increase as Canadian trips did when the dollar was in their favor. The preliminary travel statistics for the post 1997 period are confirming that this is indeed the case. Between August 1997 and August 1998, same day automobile trips by Canadians to the United States fell 28 percent while American trips rose 6.4 percent. This differential behavior is also seen in overnight and total trips.

With respect to income, there is a striking difference as the Canadian coefficient is positive, yielding a long run elasticity of 1.94 whereas the U.S. coefficient is negative yielding a long run elasticity of -0.88. A one percent increase in real per capita personal disposable income raises same day auto trips in Canada by almost 2 percent

whereas it lowers U.S. trips by about nine-tenths of one percent, all other things given. In economic consumer theory, goods and products with a positive income elasticity are classified as "normal" goods and if the positive elasticity is greater than one, they are termed "superior" goods. On the other hand, goods with negative income elasticities are termed "inferior" goods. As income rises, consumers devote a larger share of their income to normal and superior goods and a smaller share to inferior goods (25, 35).

It would appear that the Canada-U.S. border marks a sharp divide when it comes to travel preferences. For Canadians, same day automobile trips to the United States are a superior good and as income rises, Canadians have a preference for making more trips to the United States. Obviously, Canadians view a trip across the border as quite a desirable commodity and as their income rises they demand more cross-border trips. For Americans, same day cross-border trips are an inferior good which implies that the preference is for something different as disposable income rises over time. In other words, Americans are substituting other types of travel for same day cross-border trips to Canada as their income rises, all other things given. Put more bluntly, for Canadians, same day cross-border trips to the United States are "steak" whereas for Americans, such trips are "hamburger" and not particularly attractive. In an interesting paper, McGreevy argues that Americans in general have a profound ignorance of Canada rooted in their historical inability to forestall establishment of Canada as an "alternate America" north of their border. As McGreevy (20, p. 14) writes, "could it be that Americans ignore the reality of Canada not because their attention is diverted elsewhere, but because they still find the very presence of Canada slightly disturbing?"

While these results are for same day excursions, they do have implications for Canadians seeking to market Canada as a tourism and travel destination in the United States. Preferences are shaped by information and obviously Canadians need to convey information about those aspects of trips to Canada that Americans would find desirable and therefore make them willing to devote a rising share of per capita income to cross-border trips. Returning to the "steak" and "hamburger" analogy, Canadians seem to view the United States as a foreign destination and therefore as income rises, they spend more on travelling there. It may be that Americans view Canada not as an exotic foreign locale but as a not particularly interesting adjunct of the United States.

In addition, the collapse in Canadian same day automobile trips that has occurred since the peak in 1991 is also partly the result of the poor performance of the Canadian economy during the 1990s and the declining income profile of average Canadians. While the depreciation of the Canadian dollar is an important factor, real per capita personal disposable income in Canada has not risen in Canada during the period 1990-1996 as opposed to the United States where it has. Over the period 1990-1996, real per capita personal disposable income rose 9.4 percent in the United States whereas it actually fell 9.3 percent in Canada.

Finally, border differences are also apparent in the fact that the determinants of Canadian same day automobile trips are a bit more diverse than for American trips. Canadians are also influenced by gasoline prices and the GST though the effect of the GST is not statistically significant at the 5 percent level. As time goes on and the GST is more internalized in consumer decision making, one would expect it to have less of an effect provided there are no increases in its rate. Ca-

nadians are also more likely to cross the border in part to take advantage of differences in gasoline prices. However, whereas the ratio of U.S. to Canadian gas prices fell during the 1980s the ratio has remained relatively flat during the 1990s.

## CONCLUSIONS

This paper has presented empirical results from regressions of per capita same day automobile cross-border trips by Canadians and Americans and the key determinants of such trips. Canadian cross-border trips are significantly affected by trips lagged one quarter, real per capita personal disposable income, the real exchange rate, the GST, the ratio of gasoline prices and seasonal factors. American cross-border trips are examined by the same aforementioned variables save the GST and the gasoline price ratio. However, American trips are negatively related to the income variable whereas Canadian trips are positively related suggesting that Canadians view same day auto trips across the border as a normal good whereas Americans view them as an inferior good. Moreover, Americans in general are less sensitive to these determinants and adjust their trips more slowly than Canadians in response to changes in economic factors. These results are intriguing but are for each country as a whole. Future research might benefit from examining cross-border trips by Americans and Canadians on a regional basis to see if there are significant regional patterns at various border points.

There are obviously differences in the way that Canadians and Americans perceive the border given the differential cross-border travel behavior exhibited by same day automobile trips. Given a long history of trade and travel across the Canada-U.S. border and the volume of cross-border travel, the

Canada-U.S. border is not currently perceived as a serious barrier to international interaction. In this sense, Canada and the United States can be seen as in the vanguard of a movement where "borders are beginning to be viewed as more economic and social barriers than military or nationalist restraints" (33, p. 144).

At the same time, the results of this paper suggest that each country perceives the boundary somewhat differently and this difference manifests itself in the empirical work. Canadians appear to view the border more as a destination area and gateway to travel opportunities whereas Americans are more likely to view it as a line of demarcation separating what interests them from what does not interest them as much. Indeed, the American view of the border is probably much more traditional than the Canadian one especially given their recent attempts to enact new border laws that, if implemented, may make crossing the border into the United States less convenient for

Canadians. The United States is planning to implement strict new immigration controls under a law known as Section 110 which was passed in 1996 and was supposed to come into effect October 1st, 1998. The law requires border guards to record the visa status of all foreigners entering and leaving the United States by land including Canadians who have long enjoyed relatively hassle-free access. At present, the law is not being implemented because systems to do so are not in place. However, the changes, if implemented, will make crossing the border into the United States a more difficult process for Canadians involving significant delays (21, 29). This may indeed have an effect on cross-border travel between the two countries and have a significant economic impact on American communities who have come to rely on Canadian cross-border shoppers. Such barriers will raise the transaction costs of crossing the border for Canadians and may ultimately serve to reduce cross-border travel by Canadians.

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FIGURE 1

Canadian and United States Cross-Border Same Day Automobile Trips: 1972-1996

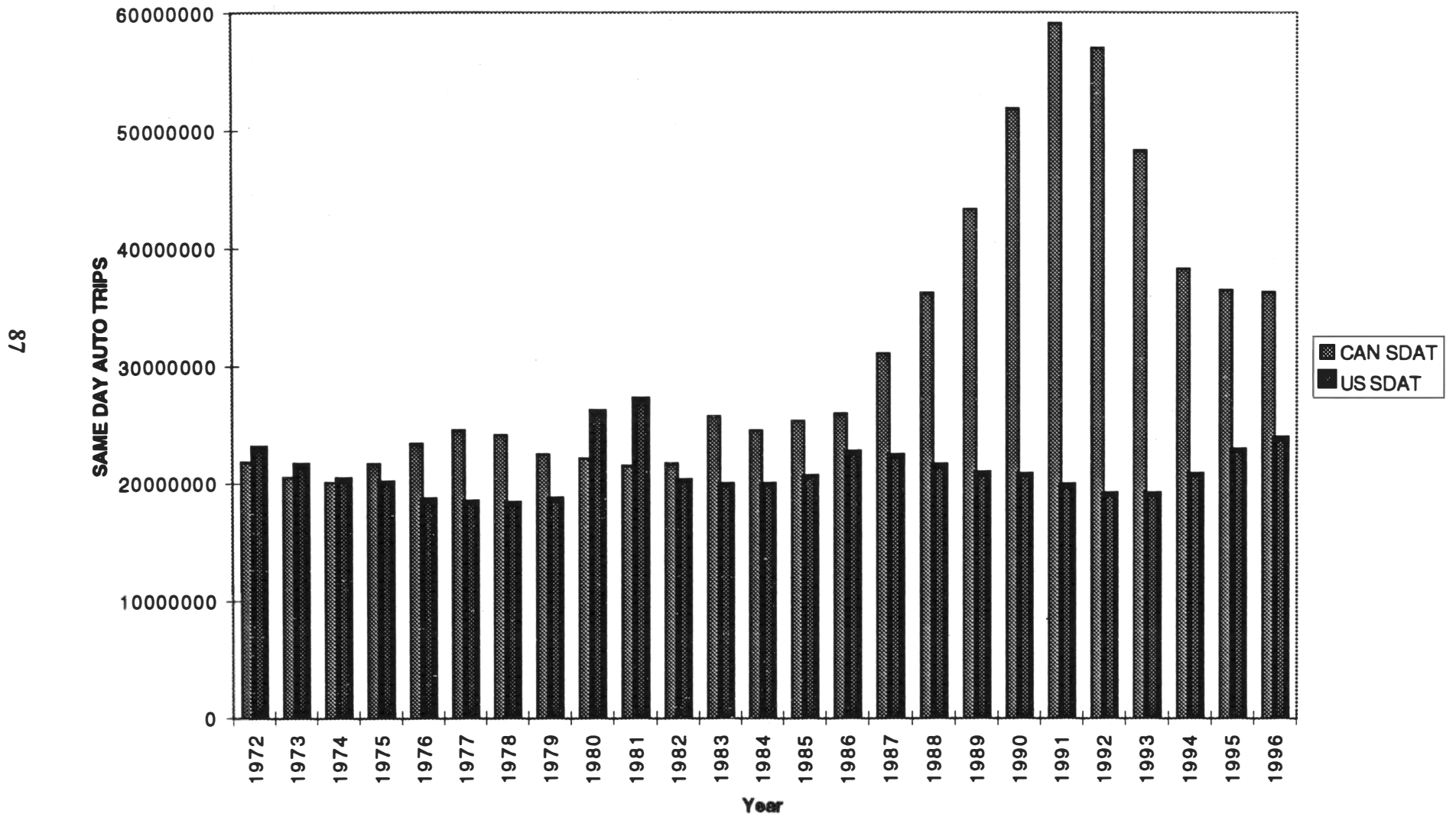


FIGURE 2

Per Capita Same Day Automobile Trips

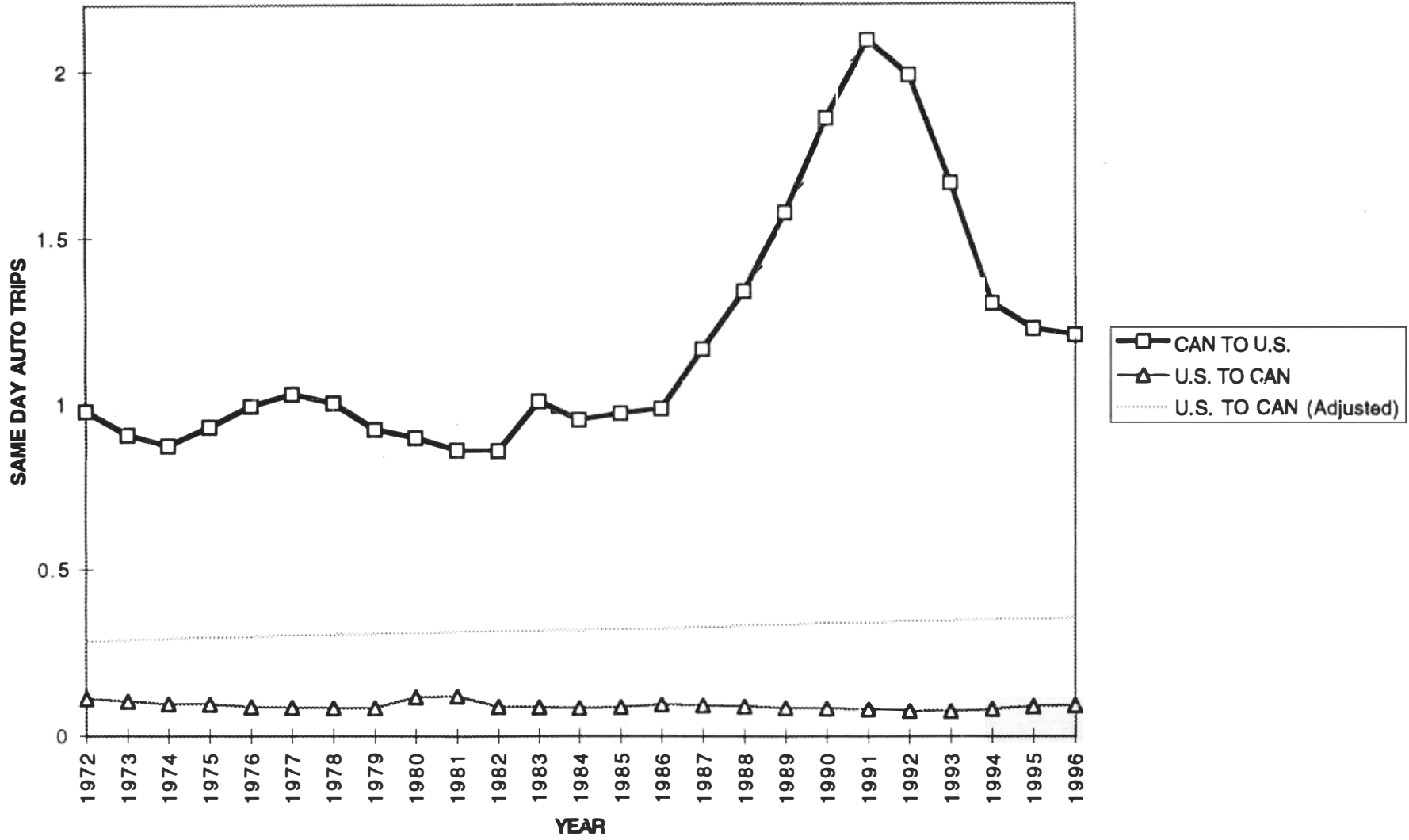


FIGURE 3

Ratio of Per Capita Canadian to American Cross-Border Quarterly Same Day Automobile Trips: 1972-1997

68

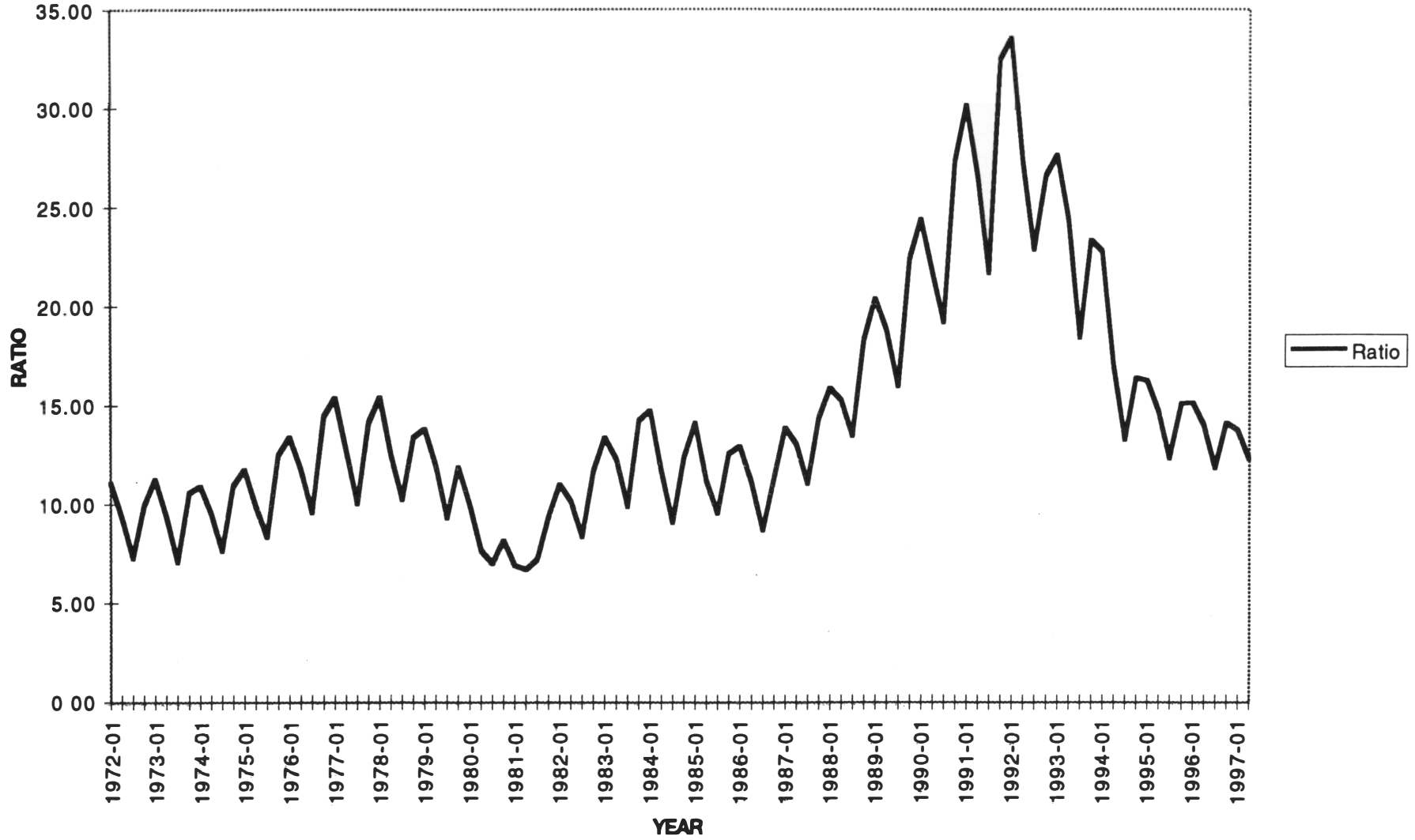


TABLE 1  
Average Annual Same Day Automobile Trips

| Period  | Canadians to U.S. | Americans to Canada |
|---------|-------------------|---------------------|
| 1972-74 | 20,798,416        | 21,598,715          |
| 1975-79 | 22,378,049        | 18,096,094          |
| 1980-84 | 23,085,397        | 22,607,239          |
| 1985-89 | 32,320,827        | 21,523,312          |
| 1990-94 | 50,884,996        | 19,839,854          |
| 1995-96 | 36,340,678        | 23,274,584          |

TABLE 2  
Variables Used in Study

|         |  |
|---------|--|
| CSDAT   | Same day automobile trips by Canadians to the United States.   |
| USDAT   | Same day automobile trips by Americans to Canada.  |
| CSDATC  | Per capita same day automobile trips by Canadians to the United States.  |
| USDATC  | Per capita same day automobile trips by Americans to Canada.   |
| CRPDIC  | Real per capital (1986 dollars) Canadian personal disposable income deflated using the Consumer Price Index (CPI)  |
| URPDIC  | Real per capita (1982-84 dollars) American personal disposable income deflated using the Consumer Price Index (CPI).   |
| REXCH   | Real exchange rate. The ratio of U.S. CPI (1982-84=100) to Canadian CPI (1986=100) multiplied by the exchange rate expressed as Canadian dollars per U.S. dollar.              |
| Q1      | First quarter dummy.   |
| Q2      | Second quarter dummy.  |
| Q3      | Third quarter dummy.   |
| GST     | Dummy variable for the Goods and Services Tax. Takes on a value of 1 for 1991 and after, 0 otherwise. The GST is a general federal consumption tax levied at a 7 percent rate. |
| EGASRAT | Exchange rate adjusted ratio of U.S. to Canadian gasoline price index.   |

TABLE 3

## Regression Results

Sample Range: 1972:2-1997:2  
 n=101  
 Specification: Log-Log

| <i>Independent Variables</i> | <i>Dependent Variables</i> |                  |
|------------------------------|----------------------------|------------------|
|                              | CSDATC                     | USDATC           |
| CONSTANT                     | -5.95<br>(-2.44)*          | 0.99<br>(1.13)   |
| CSDATC(-1)                   | 0.70<br>(7.70)             |                  |
| USDATC(-1)                   |                            | 0.65<br>(6.49)   |
| CRPDIC                       | 0.59<br>(2.32)             |                  |
| URPDIC                       |                            | -0.30<br>(-3.17) |
| REXCH                        | -0.55<br>(-3.21)           | 0.31<br>(2.54)   |
| EGASRAT                      | -0.16<br>(-3.26)           |                  |
| GST                          | 0.07<br>(1.77)             |                  |
| Q1                           | 0.08<br>(2.35)             | 0.22<br>(3.10)   |
| Q2                           | 0.39<br>(10.79)            | 0.69<br>(9.59)   |
| Q3                           | 0.37<br>(16.89)            | 0.78<br>(18.70)  |
| Adjusted R-squared           | 0.96                       | 0.91             |
| Durbin-Watson                | 1.91                       | 1.86             |
| F-statistic                  | 280.26                     | 171.22           |

\*t-statistics in brackets