The Effect of Increased Customs Scrutiny on Legal Entrance into the United States

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By

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Abstract

In the years since the terrorist attacks on September 11th, 2001 led to greatly increased security scrutiny at the United States’s ports of entry, there has been a general decline in the number of people legally entering the country over land borders. This general decline has been most pronounced among people crossing the border in personal vehicles, which is the largest category of crosser by far. This thesis will show, by controlling for other measurable factors that might direct the volume of cross-border traffic, that the disproportionate decline in persons crossing the border in personal vehicles can be tied to intensified security procedures by Customs and Border Patrol, an agency with the U.S. Department of Homeland Security, since 2001.

Using the Bureau of Transportation Statistics’s Border Entry Data set, along with data from several other sources, including the Economic Statistics Administration and the U.S. Census Bureau, I have assembled traffic volume data from each of 112 ports of entry along both the Mexican and Canadian borders. I have paired this data with several economic and demographic indicators about the area surrounding each port in an attempt to capture the motivation of those people crossing the border. By doing this, I was able to isolate border crossers’ motivations; doing so allowed me to judge how strong of an effect the inconvenience of increased scrutiny by Customs has had on their decisions to enter the United States.

Using two time periods to encapsulate the security culture at the border both immediately following the September 11th attacks and in the proceeding years, my model shows that increased customs scrutiny has had a significant downward effect on the number of auto passengers who enter the United States. This effect is more pronounced at the Canadian border, which may be due to increased security being more of a shock to the system there than at the relatively constrained Mexican border. Overall, this suggests that policymakers focus their efforts on analyzing whether the increased security at the Canadian border is worth the economic disruption it causes versus the ability to dissuade terrorists from conducting operations by crossing the US-Canadian border.
The research and writing of this thesis is dedicated to everyone who helped me throughout the project. I’d like to give special recognition to Andrea DelGiudice, and my parents, and especially Professor John Nail.

Thank you,
Matt Butram
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Introduction

The United States’s borders with Mexico and Canada, stretching past 14 states and across nearly 7,500 miles, are dotted with more than 200 ports of entry. These ports, which range from San Diego’s San Ysidro crossing, one of the busiest in the world, to several isolated crossings between Canada and the United States which may only see several cars in a day, are the processing centers for every person entering the United States over land. Immediately following the terrorist attacks on September 11, 2001, Robert Bonner, the new commissioner of United States Customs Service, ordered all ports of entry to a Level One Alert.¹ Commercial and personal traffic across the border ground to a halt as customs inspections become much more regular and thorough. Although the severe delays experienced after September 11th were alleviated in the proceeding weeks, crossing the border has become a more involved and time-consuming process for many people.

In 2004, President Bush signed the Intelligence Reform and Terrorism Prevention Act into law. Among other things, this law mandated that the Department of Homeland Security and the Department of State develop a system to ensure that all people entering the United States present a passport or other secure document declaring their identification and citizenship.² Working with the governments of Mexico, Canada, and the Caribbean nations as part of the Western Hemisphere Travel Initiative (WHTI), the United States implemented this passport requirement for all airplane passengers in

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January 2007. In January 2008, the Department of Homeland Security expanded the WHTI to cover land border crossings. This new rule has added a major administrative barrier to entering the United States.

Many have expressed concern that this new requirement is discouraging cross-border travel, especially from Canada, where people had previously been allowed to orally declare their citizenship. With this policy change coming fully into effect, it is useful to take a look back at the flow of people into the United States over the past ten years. Has increased security and scrutiny at the border had a negative effect on personal travel into the United States? Millions of people enter the United States from Canada and Mexico every year; not only on pleasure trips but for trade and employment. Even in a time when the exchange rate favors entry, are people being discouraged from crossing the border by current customs policies?

Background

On September 11th, 2001, all U.S. ports of entry were placed on Level One Alert. This state-of-emergency security level called for all entering vehicles to be individually inspected, causing cross-border traffic to grind to a halt. Although additional U.S. Customs Service personnel were able to help traffic get moving again in the following days, the incident showed that increased security measures at the border could severely curtail ease of entry.

In late 2001, the government of the United States reached an accord with the governments of Canada and Mexico, called the Smart Borders initiative, in which the

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3 Steven Brill, After: How America Confronted the September 12th Era (New York: Simon and Schuster, 2003), 45
three countries agreed to standardize and computerize their customs and border entry procedures.  

Despite this trilateral agreement, the situations at the northern and southern borders of the United States are now and have historically been very different. Until recently, the only paperwork required for U.S. and Canadian citizens to enter each country was some form of government identification. Mexican citizens have always needed a visa of some variety to enter the United States. Many of the Mexican citizens who cross the southern border every day, either for work or for personal trips, have special “laser visas,” which allow daily entry into the country.

The first international efforts to lessen the burden on travelers moving through land ports of entry were the NEXUS and SENTRI programs. Participants in these programs, low risk individuals who are willing to submit to special background screening, are expedited through customs at ports of entry, often able to use special express lanes. NEXUS, which is operated in a partnership with the Canada Border Services Agency, was initiated in 2002. NEXUS is currently in operation at 11 ports of entry, including many high-traffic portals such as Ambassador Bridge in Detroit and Point Roberts, near Seattle. SENTRI was initiated at the Otay Mesa port of entry, near

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San Diego, in 1995. Since then, it has expanded to eight other ports along the Mexican border.\textsuperscript{8}

The standardization promised in 2001 was brought to bear in the United States with the passage of the Intelligence Reform and Terrorism Prevention Act of 2004, which required that all persons entering the United States present government-issued identification. This requirement, enacted as part of the Western Hemisphere Travel Initiative, went into effect for all land crossings by January, 2008. Since that time, a person entering the United States at the Mexican or Canadian borders has been required to present a passport, special visa, or NEXUS/SENTRI card.\textsuperscript{9}

Many commentators, and politicians from both the United States and Canada, have expressed concern that increased scrutiny on the northern border has discouraged the flow of non-commercial traffic between the two countries. They feel that a passport requirement, now that it is in effect, will, discourage cross-border traffic even more.\textsuperscript{10}

\textbf{Literature Review}

Although many academic and government commentators have made direct allusions to the relationship between increased security at the border and decreased cross-border personal travel, there has a surprising paucity of research in this area. Instead, most scholars tend to either skip right to recommendations to make border crossing more secure and efficient or analyze the international political and economic implications of the problem. I haven’t been able to find any academic work that directly corresponds to

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\textsuperscript{9} “WHTI Fact Sheet”
\end{flushleft}

\begin{flushleft}
\textsuperscript{10} U.S. Congress. Senate. Committee on the Judiciary. \textit{The Western Hemisphere Travel Initiative.} 109\textsuperscript{th} Congress, Second session. 2 December, 2005.
\end{flushleft}
my own research into the effect of security on border crossing decisions, but there is a
wealth of material available in which experts have made suggestions to correct problems
of inefficiency and ineffectiveness at ports of entry.

Michael O’Hanlon of the Brookings Institute says that any effort to increase
border security must focus on improving the technological abilities of the Customs and
Border Protection. He argues that this is the only way for the various U.S. ports of entry
to work as a cohesive unit to prevent terrorism.\textsuperscript{11}

In \textit{Current History}, Peter Andreas stresses that the U.S.-Mexican border must be
protected through effective risk management. He suggests that the problem of illegal
immigration across that border be controlled through labor market regulation, freeing up
at-border and port-of-entry activities to focus on counter-terrorism.\textsuperscript{12}

David Haglund, in \textit{Orbis}, warns that ratcheting security up too high on the
northern border might antagonize Canada. Since the September 11\textsuperscript{th} terrorist attacks, that
country has been put in the unfamiliar position of having its security apparatus routinely
and publicly bemoaned by U.S. politicians and civil servants. This situation, spurred by
often-false rumors of cross-border incursions, is an unusual situation for usually-favored
Canada.\textsuperscript{13}

\begin{itemize}
\item \textsuperscript{11} Michael O’Hanlon, “Homeland Security: Border Protection,” testimony, Brookings Institution on June
28, 2006, 8pp
\item \textsuperscript{12} Peter Andreas, “Politics on Edge: Managing the US-Mexico Border,” \textit{Current History} (February 2006):
64 – 68.
\item \textsuperscript{13} David Haglund, “North American Cooperation in an Era of Homeland Security,” \textit{Orbis} (Fall 2003): 675
– 691.
\end{itemize}
Hypothesis

Intensified scrutiny and increased security at U.S. land ports of entry in the wake of the September 11th terrorist attacks has disproportionately discouraged people from entering the country by car.

Conceptual Framework

Four major factors play into the number of persons crossing the border by car. The most important is inconvenience: if crossing in a car requires more time or effort than crossing by another method, persons crossing in automobiles will decrease. Inconvenience includes wait times and special documentation requirements, both of which have increased since the September 11th terrorist attacks.

The North American economy also plays an important role. When the U.S. dollar is weak against the Canadian dollar, more Canadians will travel to the United States to vacation. Additionally, those Canadians who live close to the border might cross to go shopping in U.S. stores. On the southern border, a weak economy could make it more difficult for some daily entrants to find work, which would discourage crossing.

Urbanity should affect the number of persons crossing by car because high urbanity will probably encourage pedestrian crossing, instead. If an entrant is only traveling across a metropolitan area, a car is not always necessary or worth the added customs inconvenience. Additionally, urban ports of entry see much more personal traffic; this is fairly self-explanatory - non-vacation personal crossings are a lot more likely to occur near cities where jobs and retail are.
Finally, the border itself is an important component on number of people crossing in cars. The northern and southern borders have completely different dynamics, which shows in the volume and ways that people cross the border. Although the southern border is much busier overall, people are much more likely to cross in cars than to use other means at the northern border. This is probably because while the northern border has Detroit and Niagara Falls, pedestrian crossings in these areas are mostly tourists. Pedestrians crossing at El Paso, San Diego, and Tecate do it regularly for work or to access retail.

My hypothesis is that increased security after the September 11th terrorist attacks has had a negative effect on people crossing the U.S. border in cars. This is despite an increasingly attractive exchange rate for Canadians and continued job opportunities for Mexicans. I believe that perceived inconvenience and actual delays associated with this increased scrutiny are putting downward pressure on border crossing totals. If this is not the case, then car passenger numbers could be dropping because more people are deciding to fly into the United States, or there could simply be less cross-border traffic because people are deciding to travel less.

**Data Source**

This paper’s principal data set is the Border Crossing/Entry Data set, which is produced by the United States Bureau of Transportation Statistics. BTS uses information provided by Customs and Border Patrol, an agency of the U.S. Department of Homeland Security. It accounts for all entrants, both personal and commercial, that cross 112 ports of entry.
The Border Crossing data set covers persons crossing the border in personal automobiles, busses, trains, and on foot. Additionally, it reports the number of trucks and loaded and unloaded truck and train containers that entered the country. Although monthly information is still collected and released annually for the Border Crossing data set, this paper uses data from 1995 through 2006.

The data set covers the 112 chief land entries into the United States during the relevant period, although a small amount of ports appear to have not reported data in individual months. This unreported data blend in with reported “zero” data, which was left unanswered by many ports; thus, I transformed all unanswered categories to zero. The number of respondents in the Border Crossing data set has remained relatively steady across the lifetime of the survey, although a few additional ports were added in 2004. The most important change in the data occurs between 1996 and 1997. The San Ysidro and Otay Mesa ports of entry both serve the San Diego metropolitan area, and are only six miles apart from each other. Starting in the early 1990’s, all trucks attempting to enter at San Ysidro were diverted to Otay Mesa. The U.S. Customs Service, the predecessor of Customs and Border Patrol, did not factor this change into their data reports, however, until 1997. Before this time, Customs reported the number of trucks that had entered Otay Mesa and San Ysidro as a single combined total.

For this paper, I intend to focus on personal travel. Thus, I will not use data on trucks, or truck and train containers entering the United States. Instead, my variable of interest will be persons in automobiles crossing the border, with controlling variables
including pedestrians, persons in busses, and persons in trains. The data set for this paper will not include any ports of entry that are used only for freight and commercial traffic.

Although the Border Crossing/Entry Data set is this paper’s chief data source, I have added several economic and demographic variables to assist in my analysis. Monthly average exchange rates, which I have amassed from historic data provided by the OANDA Corporation, can be incorporated easily with the Border Crossing data. The main data set reports monthly cross-border traffic, so the exchange rate, which is reported in U.S. dollars, can be added for each port of entry for whichever national border it is on. Another economic variable that I used is the monthly local unemployment rate for the county in which the port of entry is located. As with the exchange rate, monthly unemployment data from the Bureau of Labor Statistics easily aligned with monthly entry figures. I have also included a variable on urbanity, which is based on the United States Census Bureau’s definition of metropolitan and rural areas. Further, I included data on the percentage of foreign born residents in each port’s state, also from the Census Bureau. This information was inserted alongside each port of entry’s data.

**Analysis Plan**

The population to be analyzed is all personal travelers entering the United States through a land port of entry. This group includes both vacationers and people crossing the border to go to work or on personal errands. I am not including data on freight or commercial border crossing; although ramped-up security after the September 11th terrorist attacks have had a profound effect on the way freight is imported into the United States, there is less opportunity for a fundamental shift in the method of transport. Where
there are four means of cross-border travel for persons (automobile, on foot, train, and bus), there are only two for freight (truck and train).

I will use a standard OLS model with a large number of indicator variables to control for several fixed effects. In order to control for fluctuations in my dependent variable, number of persons to enter the country in automobiles, I will use the natural log of that variable. As a further step to minimize the effect of seasonal fluctuations in the dependent variable, I will include an indicator variable for each month of the year. This is necessary because the volume of traffic at many ports of entry, especially those on the Canadian border, shift widely throughout the year. August is the heaviest month for traffic while February is the lightest.

My variables of interest will be two time period indicator variables, one of which will cover the year after September 2001 and another which will cover the time from October 2002 through the end of the sample in 2006. The time period before October 2001 will act as the baseline.

In order to control for the effect of ports with heavy non-automobile traffic (such as Niagara Falls, New York and Otay Mesa, California), I have added controls for the three other types of travel that the survey records: pedestrian, bus, and train. Additionally, I have included several variables that take the economic and social situation surrounding each port of entry into account. These are used to control for non-security related border crossing decisions.
Finally, there is a control variable for which border a port of entry is located on. The Canadian and Mexican borders have very different cultures; this variable should account for those differences.

My regression model is:

\[
\ln(cars) = B_0 + B_1(timeperiod2) + B_2(timeperiod3) + B_3(peds) + B_4(bus) + B_5(train) + B_6(mex) \\
+ B_7(exchange) + B_8(unemploy) + B_9(metro) + B_{10}(foreignborn) + x + \mu
\]

where:

- **cars**: passengers in automobiles
- **peds**: pedestrians
- **bus**: passengers in buses
- **train**: passengers in trains
- **mex**: Southern Border
- **exchange**: exchange rate
- **unemploy**: local unemployment rate
- **foreignborn**: percent of foreign-born people in state
- **metro**: located within a metropolitan area
- **timeperiod1**: January 1995 through September 2001
- **timeperiod2**: October 2001 through September 2002
- **timeperiod3**: October 2002 through December 2006

and:

\[
x = B_{11}(February) + B_{12}(March) + B_{13}(April) + B_{14}(May) + B_{15}(June) + B_{16}(July) + \\
B_{17}(August) + B_{18}(September) + B_{19}(October) + B_{20}(November) + B_{21}(December)
\]

**Passengers in Automobiles**: This is the dependent variable. It is used in natural log-form in order to control for wide seasonal swings in volume. This category of personal travelers accounts for the largest percentage of entrants by far; it has also shown sustained downward movement in recent years.

**Pedestrians**: This variable controls for the number of pedestrians who cross the border. In urban areas, pedestrian trips can be substitutes for automobile trips for some border-crossers. Thus, there could be a negative correlation between the number of automobile and pedestrian trips. Pedestrian border crossers make up a sizeable minority of entrants at southern border ports of entry.
**Passengers in Buses:** Although they account for a much smaller percentage of total entrants than pedestrians, bus passengers are also substitutes for automobile passengers. Bus passengers are probably less likely to be from border-affronting metropolitan areas than pedestrians, and thus might be represented in larger numbers at rural ports of entry.

**Passengers in Trains:** Similar to bus passengers and pedestrians, passengers on trains serve as a control variable because they are a substitute for passengers in cars. The different customs procedures used for train passengers might lead some people to choose to cross the border on rails rather than in their automobile.

**Southern Border:** This is an indicator variable to differentiate whether the port of entry is at the northern or southern border. The two borders see vastly different types of entrants, and different seasonal traffic patterns. The Mexican border is busier in general, but also has a much larger percentage of pedestrian entrants.

**Exchange Rate:** When the U.S. Dollar is weak against either the Canadian Dollar or the Peso, tourists from those two countries will be encouraged to travel to the United States. Additionally, people who live near the border in either country would be more inclined, when the dollar is weak, to cross the border for shopping and services.

**Local Unemployment Rate:** The unemployment rate in the county in which a port of entry is situated can have an important effect on cross-border travel for a person who is allowed to enter the country for work. There should be a negative correlation between the unemployment rate and entrance into the United States by documented workers – if they have no job to go to, those workers will not enter the country as often.
**Percent of Foreign Born in State:** This variable is a measure of the percent of foreign born residents in the state in which the port of entry is located. From 2001 through 2006 data from the Census Bureau’s American Community Survey is used. Before 2001, data from the 2000 census is used. If a state has a high percentage of foreign born residents, it is more likely that people will make personal border crossings there, because they may be able to find familiar goods and services, or visit friends or relatives.

**Located Within a Metropolitan Area:** This is an indicator variable. Using Census Bureau data, this variable shows whether or not a port of entry is located within a metropolitan area. If a port of entry is within a metropolitan area, there will probably be more pedestrian and fewer automobile crossers, since entrants are more likely to be able to walk or take public transportation to their destination within the United States.

**January 1995 through September 2001:** This is an indicator variable. It indicates data for the time period before the September 11th terrorist attacks, and is used as a reference in the model.

**October 2001 through September 2002:** This is an indicator variable. It indicates data for the time period from October 2001 through September 2002, which captures the immediate aftermath of the September 11th terrorist attacks.

**October 2002 through December 2006:** This is an indicator variable. It indicates data for the time period from October 2002 through December 2006. This covers the time period after the immediate aftermath of the September 11th terrorist attacks, when several new border security measures and trilateral international initiatives had been designed and were going into effect.
Preliminary Findings

Table 1
Monthly Descriptive Statistics for All Ports of Entry

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Passengers</td>
<td>228,089.8</td>
<td>519,242</td>
<td>5,990,046</td>
<td>3</td>
</tr>
<tr>
<td>Bus Passengers</td>
<td>7,837</td>
<td>22,440</td>
<td>513,477</td>
<td>1</td>
</tr>
<tr>
<td>Train Passengers</td>
<td>723.16</td>
<td>1,548</td>
<td>26,374</td>
<td>0</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>57,585</td>
<td>149,042</td>
<td>1,227,544</td>
<td>0</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>7.75</td>
<td>5.63</td>
<td>42.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
</tbody>
</table>

Table 2
Monthly Descriptive Statistics for Mexican Ports of Entry

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Passengers</td>
<td>687,040.2</td>
<td>821,756</td>
<td>5,990,046</td>
<td>718</td>
</tr>
<tr>
<td>Bus Passengers</td>
<td>13,193.65</td>
<td>26,648</td>
<td>513,477</td>
<td>1</td>
</tr>
<tr>
<td>Train Passengers</td>
<td>225.97</td>
<td>223.02</td>
<td>1197</td>
<td>0</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>154,064.8</td>
<td>213,383</td>
<td>1,227,544</td>
<td>5</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>12.08</td>
<td>8.38</td>
<td>42.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>9.41</td>
<td>1.5</td>
<td>11.54</td>
<td>5.58</td>
</tr>
</tbody>
</table>

Table 3
Descriptive Statistics for Canadian Ports of Entry

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Passengers</td>
<td>84,609.31</td>
<td>237,471</td>
<td>2,523,598</td>
<td>3</td>
</tr>
<tr>
<td>Bus Passengers</td>
<td>5961.11</td>
<td>20,439</td>
<td>248,370</td>
<td>1</td>
</tr>
<tr>
<td>Train Passengers</td>
<td>838.37</td>
<td>1,694</td>
<td>26,374</td>
<td>0</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>1386.4</td>
<td>7,347</td>
<td>181,648</td>
<td>0</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>6.34</td>
<td>3.33</td>
<td>32</td>
<td>0.7</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>1.39</td>
<td>0.13</td>
<td>1.60</td>
<td>1.11</td>
</tr>
</tbody>
</table>
### Table 4
Frequency Distribution of Indicator Variables and Frequency Distribution of Ports of Entry Across the Border States

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian Border</td>
<td>85</td>
<td>77%</td>
</tr>
<tr>
<td>Mexican Border</td>
<td>26</td>
<td>23%</td>
</tr>
<tr>
<td>Inside a Metropolitan Area</td>
<td>29</td>
<td>26%</td>
</tr>
<tr>
<td>Outside a Metropolitan Area</td>
<td>71</td>
<td>74%</td>
</tr>
<tr>
<td>Alaska</td>
<td>3</td>
<td>3.06%</td>
</tr>
<tr>
<td>Arizona</td>
<td>6</td>
<td>5.65%</td>
</tr>
<tr>
<td>California</td>
<td>7</td>
<td>6.59%</td>
</tr>
<tr>
<td>Idaho</td>
<td>2</td>
<td>1.88%</td>
</tr>
<tr>
<td>Maine</td>
<td>12</td>
<td>10.83%</td>
</tr>
<tr>
<td>Michigan</td>
<td>3</td>
<td>2.83%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>8</td>
<td>6.83%</td>
</tr>
<tr>
<td>Montana</td>
<td>13</td>
<td>10.75%</td>
</tr>
<tr>
<td>New Mexico</td>
<td>2</td>
<td>1.88%</td>
</tr>
<tr>
<td>New York</td>
<td>6</td>
<td>5.65%</td>
</tr>
<tr>
<td>North Dakota</td>
<td>18</td>
<td>16.95%</td>
</tr>
<tr>
<td>Texas</td>
<td>11</td>
<td>10.36%</td>
</tr>
<tr>
<td>Vermont</td>
<td>5</td>
<td>4.71%</td>
</tr>
<tr>
<td>Washington</td>
<td>15</td>
<td>12.01%</td>
</tr>
</tbody>
</table>

### Table 5
Mean Yearly Exchange Rate for One U.S. Dollar

<table>
<thead>
<tr>
<th>Year</th>
<th>Canadian Dollar</th>
<th>Mexican Peso</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>1.37258</td>
<td>6.27601</td>
</tr>
<tr>
<td>1996</td>
<td>1.36381</td>
<td>7.60455</td>
</tr>
<tr>
<td>1997</td>
<td>1.38488</td>
<td>7.92500</td>
</tr>
<tr>
<td>1998</td>
<td>1.48363</td>
<td>9.15491</td>
</tr>
<tr>
<td>1999</td>
<td>1.48586</td>
<td>9.55698</td>
</tr>
<tr>
<td>2000</td>
<td>1.48526</td>
<td>9.46538</td>
</tr>
<tr>
<td>2001</td>
<td>1.54904</td>
<td>9.34658</td>
</tr>
<tr>
<td>2002</td>
<td>1.57021</td>
<td>9.68249</td>
</tr>
<tr>
<td>2003</td>
<td>1.40097</td>
<td>10.80599</td>
</tr>
<tr>
<td>2004</td>
<td>1.30151</td>
<td>11.30933</td>
</tr>
<tr>
<td>2005</td>
<td>1.21173</td>
<td>10.90482</td>
</tr>
<tr>
<td>2006</td>
<td>1.13461</td>
<td>10.91549</td>
</tr>
<tr>
<td>Year</td>
<td>Auto</td>
<td>Percent Change</td>
</tr>
<tr>
<td>------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>1995</td>
<td>265,959,174</td>
<td>...</td>
</tr>
<tr>
<td>1996</td>
<td>272,593,220</td>
<td>2.5%</td>
</tr>
<tr>
<td>1997</td>
<td>307,001,980</td>
<td>12.6%</td>
</tr>
<tr>
<td>1998</td>
<td>314,295,857</td>
<td>2.4%</td>
</tr>
<tr>
<td>1999</td>
<td>330,891,505</td>
<td>5.3%</td>
</tr>
<tr>
<td>2000</td>
<td>329,841,500</td>
<td>-0.3%</td>
</tr>
<tr>
<td>2001</td>
<td>284,076,951</td>
<td>-13.9%</td>
</tr>
<tr>
<td>2002</td>
<td>269,028,604</td>
<td>-5.3%</td>
</tr>
<tr>
<td>2003</td>
<td>255,199,884</td>
<td>-5.1%</td>
</tr>
<tr>
<td>2004</td>
<td>254,206,275</td>
<td>-0.3%</td>
</tr>
<tr>
<td>2005</td>
<td>248,568,824</td>
<td>-2.2%</td>
</tr>
<tr>
<td>2006</td>
<td>242,241,051</td>
<td>-2.5%</td>
</tr>
</tbody>
</table>

Table 7
Percentage of Foreign Born Persons in Population

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Canadian Border (Avg.)</th>
<th>Mexican Border States (Avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>11.1</td>
<td>6.96</td>
<td>15.28</td>
</tr>
<tr>
<td>2006</td>
<td>12.5</td>
<td>7.02</td>
<td>17.08</td>
</tr>
</tbody>
</table>
Establishing Results: A Discussion of the “Foreign Born” variable

In the model, the foreign born variable, which measures the proportion of foreign-born residents in the state in which a port is located, is slightly irregular. Yearly data was

### Table 8
The Effect of Eliminating the Estimated Foreign Born Variable

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>9.10859*** (0.06493)</td>
<td>9.56968*** (0.06479)</td>
<td>9.10088*** (0.09687)</td>
<td>9.53932*** (0.09725)</td>
</tr>
<tr>
<td>Time Period 2</td>
<td>-0.23093*** (0.04616)</td>
<td>-0.17548*** (0.04744)</td>
<td>-0.20136*** (0.05410)</td>
<td>-0.16984*** (0.05551)</td>
</tr>
<tr>
<td>Time Period 3</td>
<td>-0.33323*** (0.02761)</td>
<td>-0.27010*** (0.02831)</td>
<td>-0.29811*** (0.03964)</td>
<td>-0.25091*** (0.04062)</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>0.00000*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
</tr>
<tr>
<td>Bus Passengers</td>
<td>0.00002*** (0.00000)</td>
<td>0.00002*** (0.00000)</td>
<td>0.00002*** (0.00000)</td>
<td>0.00002*** (0.00000)</td>
</tr>
<tr>
<td>Train Passengers</td>
<td>0.00027*** (0.00002)</td>
<td>0.00031*** (0.00002)</td>
<td>0.00024*** (0.00002)</td>
<td>0.00027*** (0.00002)</td>
</tr>
<tr>
<td>Mexican Border?</td>
<td>0.13745 (0.15755)</td>
<td>0.30430* (0.16194)</td>
<td>0.64958* (0.35971)</td>
<td>1.4307*** (0.36849)</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>0.13286*** (0.01839)</td>
<td>0.17549** (0.01885)</td>
<td>0.09449** (0.03949)</td>
<td>0.09698** (0.04051)</td>
</tr>
<tr>
<td>Unemploy. Rate</td>
<td>0.04928*** (0.00272)</td>
<td>0.06508*** (0.00274)</td>
<td>0.05375*** (0.00476)</td>
<td>0.07823*** (0.00475)</td>
</tr>
<tr>
<td>Metropolitan Area?</td>
<td>-0.93826*** (0.03709)</td>
<td>-1.24758*** (0.03656)</td>
<td>-0.90533*** (0.04802)</td>
<td>-1.20804*** (0.04717)</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>7.27009*** (0.24853)</td>
<td>…</td>
<td>6.91951*** (0.31866)</td>
<td>…</td>
</tr>
</tbody>
</table>

***p < 0.01  **p < 0.05  *p < 0.10
Number of observations used for Specifications 1 & 2: 14,792
Number of observations used for Specifications 3 & 4: 8,794
unavailable before the year 2000; the proportion of foreign born residents in these states in the years 1995 – 2006 was estimated by repeating the data for the year 2000. Because of this irregularity, it is necessary to consider the effect of limiting or eliminating the foreign born variable from the model.

In order to determine whether or not the variable for foreign born population should be included within the model, an F-test for variable significance is necessary…

\[
F = \frac{(SSR_{restricted} - SSR_{unrestricted})}{SSR_{unrestricted}} \frac{1}{(n - k - 1)}
\]

For the full sample of years…

\[
F = \frac{(35008 - 33083)}{33083} \frac{1}{(14792 - 20 - 1)} = 859.4799
\]

So if...

\(H_0: \text{Foreign Born} = 0\)

\(H_1: \text{Foreign Born} \neq 0\)

\(F_{stat} = 859.4799\)

With such a high \(F_{stat}\), we will reject the null hypothesis. The foreign born statistic is a significant part of the model. The same holds true when we test only for the years 2000 through 2007:

\[
F = \frac{(20908 - 19832)}{19832} \frac{1}{(8794 - 20 - 1)} = 475.9857
\]

\(H_0: \text{Foreign Born} = 0\)

\(H_1: \text{Foreign Born} \neq 0\)

\(F_{stat} = 475.9857\)
It can be seen that exclusion of the foreign born variable has an upward effect on the two variables of interest, time periods two and three (October 2001 – September 2002 and October 2002 – December 2006, respectively). In both specification 2 and 4, each of these two variables shows a higher coefficient when the foreign born variable is excluded. This difference is much smaller when the model is limited to non-estimated years (specification 4). Specification 2 shows that the foreign born variable, when excluded, has an upward effect on the coefficient on the Mexican border, the local unemployment rate, and exchange rate. It has a downward effect on the coefficient on metropolitan area. Specification 4 shows the same results across those variables. Aside from the coefficient on the Mexican border variable which rises by a larger amount, the magnitude of the increases when the foreign born variable is similar.

Given this, it is worth it to include the foreign born variable in the model, even in its estimated form. We can see that the exclusion of the foreign born variable has a roughly similar upward effect on the model both when we include the whole estimated data and only non-estimated data. The foreign born variable has been shown, using the F-test, to have explanatory value, even when it is estimated for years 1995 – 2000. Because of its explanatory value, and the similar effect the estimated and non-estimated version had when excluded, the full estimated foreign born variable was not removed from the model.

Results

I used four specifications to analyze the model. Specification 1 uses the full sample. Specifications 2 and 3 use only the Canadian and Mexican borders, respectively.
Specification 4 uses only the top twenty ports (from both borders) in terms of automobile passenger volume. Although my variables of interest of interest are time period two (October 2001 – September 2002) and three (October 2002 – December 2006), the model reveals that several other factors play a role in people’s crossing decisions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>9.10859*** (0.06493)</td>
<td>9.96982*** (0.23820)</td>
<td>10.53016*** (0.17915)</td>
<td>13.41501*** (0.03914)</td>
</tr>
<tr>
<td>Time Period 2</td>
<td>-0.23093*** (0.04616)</td>
<td>-0.19779*** (0.05757)</td>
<td>-0.10150 (0.06396)</td>
<td>-0.25553*** (0.02882)</td>
</tr>
<tr>
<td>Time Period 3</td>
<td>-0.33323*** (0.02761)</td>
<td>-0.39852*** (0.04002)</td>
<td>-0.10608* (0.05628)</td>
<td>-0.32766*** (0.02152)</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>0.00000*** (0.00000)</td>
<td>-0.00003*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
</tr>
<tr>
<td>Bus Passengers</td>
<td>0.00002*** (0.00000)</td>
<td>0.00003*** (0.00000)</td>
<td>0.00001*** (0.00000)</td>
<td>0.00000*** (0.00000)</td>
</tr>
<tr>
<td>Train Passengers</td>
<td>0.00027*** (0.00002)</td>
<td>0.00013*** (0.00002)</td>
<td>0.00133*** (0.00012)</td>
<td>-0.00000 (0.00000)</td>
</tr>
<tr>
<td>Mexican Border?</td>
<td>0.13745 (0.15755)</td>
<td>...</td>
<td>...</td>
<td>0.29587*** (0.07641)</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>0.13286*** (0.01839)</td>
<td>-0.13434 (0.15531)</td>
<td>0.03893*** (0.01829)</td>
<td>0.02488*** (0.00838)</td>
</tr>
<tr>
<td>Unemployment</td>
<td>0.04928*** (0.00272)</td>
<td>0.06449*** (0.00479)</td>
<td>0.01972*** (0.00227)</td>
<td>-0.01137*** (0.00125)</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>-0.93826*** (0.03709)</td>
<td>-1.76916*** (0.04843)</td>
<td>0.35557*** (0.04070)</td>
<td>-0.63668*** (0.01979)</td>
</tr>
<tr>
<td>Area?</td>
<td>7.27009*** (0.24853)</td>
<td>8.63102*** (0.30965)</td>
<td>3.90254*** (0.30433)</td>
<td>-1.09636*** (0.14708)</td>
</tr>
<tr>
<td>Proportion of</td>
<td>0.00953 (0.06046)</td>
<td>0.01850 (0.07092)</td>
<td>-0.02076 (0.08110)</td>
<td>-0.06538* (0.03729)</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>0.09981* (0.06036)</td>
<td>0.12723* (0.07079)</td>
<td>-0.02170 (0.08100)</td>
<td>0.00854 (0.03729)</td>
</tr>
<tr>
<td>February</td>
<td>0.03828** (0.01508)</td>
<td>0.04854*** (0.01771)</td>
<td>0.00892 (0.02023)</td>
<td>-0.00473 (0.00933)</td>
</tr>
</tbody>
</table>
In specification 1, the coefficients on time periods two and three are highly significant. All other things being equal, a port in time period two was likely to see about 23.1% fewer auto passengers cross the border than before October, 2001. This effect is magnified for time period three: all other things being equal, around 33.3% fewer auto passengers were likely to cross the border at each port than before October, 2001. This sharp decline over time was controlled by several different variables. Ports at the Mexican border were likely to see 13.7% more auto passengers than those at the Canadian border. Additionally, as either the Canadian dollar or the Mexican Peso appreciates 10 cents versus the American dollar, ports were likely to see a 1.3% increase in auto passengers.
The local unemployment rate on the United States side of the border also had a significant effect on crossing behavior, although not in the expected direction. For every 1% increase in the county unemployment rate for a port, it can be expected that there will be a 4.9% increase in auto passengers crossing the boarder. This can be explained in a couple of ways: first, some of the counties with the highest unemployment rates in the United States, including Presidio in Texas and Yuma in Arizona, also contain one of more very busy border crossings. This anomaly could throw off this variable. It is also possible that counties with high unemployment rates may encourage cross-border traffic by forcing United States citizens to seek work in either Mexico or Canada. These citizens would be counted as entrants to the United States when they crossed the border to come home at the end of the day. Another explanation is that the areas on both sides of the border near these ports of entry were experiencing high unemployment rates at the time. Despite the sour job market in the United States, people crossed the border because their prospects were worse in Mexico or Canada.

The coefficient on the dummy variable for metropolitan area, which suggests that, all other things being equal, if a port is in a metropolitan area it will have 93.8% less auto passengers than one that is not, is also surprising. Since some of the busiest ports in the country, including San Ysidro (in San Diego) and Detroit, are in metropolitan areas, this variable could be expected to be positive. A closer look at the data shows why this is probably not the case: the outer reaches of many metropolitan areas, which are defined by county, can be quite rural. Many ports in these areas handle a relatively light volume of
traffic. This is especially the case in New England, where most counties are part of one metropolitan area or another.

The coefficient on foreign born population looks untenably large, but it must be divided by 100 to be appropriately interpreted. This suggests that, all other things being equal, for a 1% rise in percent of foreign born persons in a port’s state, there would be a 7.3% rise in auto passengers crossing the border.

The dummy variables controlling for each month are, generally, slightly less significant than the other variables in the model. However, where they can be statistically proven to be different than zero (which they can in all cases other than February), they show that January is the slowest month of the year for auto passengers crossing the border. The busiest is June, when, all other things being equal, 58.7% more auto passengers cross than in January.

Specification 2 shows that when just the Canadian border is examined, several of the variables in the model have different effects. The coefficient on the time period two actually increases as compared to the same variable in specification 1; all other things being equal, 19.8% fewer automobile passengers were likely to cross the Canadian border than before October 2001. For time period three, however, 39.8% fewer automobile passengers were likely to cross the border than before October 2001. This sharp decline shows that, as new customs security procedures (and accompanying delays) were set in stone, more Canadian border crossers began to find other ways to enter the United States. It could also be seen as Canadians and Americans preparing for the requirement that they
show proof of citizenship before entering either country, and making fewer trips because of it.

The coefficient on the unemployment rate is such that, all things being equal, for every 1% increase in local unemployment, there is a corresponding 6.4% increase in automobile passengers crossing the border. As with specification 1, this can probably be explained by higher-than normal unemployment rates in rural areas along the border, and unemployed job-seekers crossing into Canada to find work. The model suggests that if a port is in a metropolitan area, there is a 176% decline in automobile passengers crossing the border. This is a striking, if significant, fact that might be explained by the relatively rural nature of most ports on the northern border of the United States. The foreign born variable closely follows its counterpart in specification 1. All things being equal, for every additional 1% of the population being foreign-born, there is an 8.6% increase in automobile passengers.

The time-of-year dummies show roughly the same thing as specification 1: January is the slowest month of the year and summer is the busiest. However, specification 2’s model predicts that July will be the busiest month, with 83.5% more auto passengers crossing the border than in January. This is likely due to the much more temperate summertime climate in the northern United States.

Specification 3 focuses on the Mexican border. The most important difference between this specification and its Canadian and full-sample counterparts is that the variables of interest, time periods two and three, are much less significant. In fact, the coefficient on time period two cannot be said to be significantly different than zero. The
coefficient on time period three, which is only significant at $p < .10$, suggests that, all things being equal, 10.6% fewer automobile passengers can be expected to cross the border in time period three than before October 2001. The relative insignificance of these variables shows the wide difference in the border cultures of Canada and Mexico. It can be surmised, since most of the other variables in the model for specification 3 produced significant results, that Mexican border crossers have not been significantly affected by increased security at customs since October 2001. This could be due to the high level of security that was already present at the border before the September 11th terrorist attacks. While security increased, it was not as much of a culture shock as along the Canadian border.

The coefficient on the exchange rate variable shows that, all things being equal, a ten cent increase in the dollar value of the Peso will result in 0.3% more auto passengers crossing the border. This coefficient is only significant at $p < 0.05$. A 1% increase in the local unemployment rate will result in a 2% increase in the number of automobile passengers, for the same reasons already described.

Interestingly, if a port is located in a metropolitan area, 35.6% more automobile passengers can be expected. This may be because most of the most popular ports of entry on the southern border of the United States are located in metropolitan areas, while rural ports are less popular. On the Canadian border, popular ports fall into both of these categories. For every 1% increase in foreign born residents of a port’s state, automobile passengers will go up by 3.9%. This coefficient may be lower than in specifications 1 or
2 because of the high percentage of foreign born residents of many border states. None of the data dummies in specification 3 were significant.

Finally, specification 4 shows that, for our variables of interest, the roughly the same coefficients are calculated when the model includes only the twenty highest volume ports of entry. All other things being equal, we can expect there to be a 25.6% drop in automobile passengers in time period two as compared to the period before October 2002. Further, we can expect to see a 32.8% drop in automobile passengers during period three as compared to the period before October 2001.

The coefficient on the Mexican border dummy is much stronger here than in specification 1. This is probably because the majority of the top twenty ports are on the Mexican border. All other things being equal, Mexican border ports were likely to see 29.6% more automobiles than Canadian border ports. For a 10 cent rise in the value of the U.S. dollar, all things being equal, there will be a 0.2% increase in automobile passengers who will cross the border. Further, a 1% increase in the local unemployment rate will result in a 1.1% decrease in the number of auto passengers to cross the border. This bucks the trend set by the other specifications, and might be as a result of border trade-based industry playing a more prominent role in the local economies surrounding the busiest ports.

If a port is in a metropolitan area, it can be expected to have 63.7% fewer automobile passengers. This coefficient, once again, stands out, but it might be the result of heavy representation amongst the top twenty ports by rural ports of entry. Finally, for every additional 1% of foreign-born residents in an area, there would be an additional
110% of automobile passengers crossing the border. This coefficient is probably influenced by the high percentage of immigrants among the population of some areas of the Mexican border states.

Across all four specifications, we can see that automobile passengers have declined in both time periods, by significant margins in specifications 1, 2, and 4. Other reasons to cross the border (economy, proximity to an urban center, availability of foreign cultures, etc.) have been controlled for. Thus, it is reasonable to surmise that the significant drops in automobile traffic across the border since October 2001 are due to the hassle and stress of increased customs scrutiny at ports of entry.

Policy Implications

We can see that most iterations of the model shows that there is a precipitous decline in auto passengers crossing the border in both time periods two (October 2001 – September 2002) and three (October 2002 – December 2006). This decline can be seen both at the Mexican and Canadian borders, though it is consistently more pronounced on the Canadian border. This could be because Canadians and Americans who cross the northern border are chaffing at a level of security that is much higher than what they are accustomed to. At the Mexican border, the threat of illegal immigration has made moving through customs a more trying ordeal for years. This is made evident by the fact that SENTRI, Mexico’s trusted traveler program, has been in operation since the mid-1990s while NEXUS was not introduced until after the September 11th terrorist attacks.¹⁴

After the introduction of the new WHTI documentation rules in January, 2008, Canadian and American business leaders have repeatedly complained that the new proof-of-citizenship requirement will hampers cross-border travel and thus the exchange of goods between the two countries. These fears are clearly grounded in reality. Although it is too early to assess the full impact of the new entry rules, cross-border travelers have already been reacting negatively to harsher customs security for several years.

Unlike travel at the Mexican border, Canadian cross-border traffic is not significantly affected by the exchange rate, despite some anecdotal evidence to the contrary. Although the model did not include data from 2007 which would have shown the Canadian dollar catching and eventually surpassing the U.S. dollar, it does show the loonie’s steadily increasing value over time. The model’s other economic indicator, local U.S. unemployment rate, does show that as the unemployment rate rises, there is a small but significant rise in automobile passengers crossing the border. Together, the results of these two indicators show that economic concerns are not as powerful a motivating factor as concerns about security and delays. Canadian border-crossers have crossed the border at a slower rate since 2001; the best explanation for this behavior seems to be their fears, real or imagined, that they’d get tied up at customs.

At the Mexican border, there is a different situation. When the southern border is measured independently of the northern, the effect of increased security at the border barely registers, with the first time period having an insignificant affect on auto

passengers crossing the border, and the second only significant at $p > .10$. Both economic indicators are significant at least $p > .10$.

Mexican border traffic seems to have weathered the problems caused by customs security that have stirred up so much angst and anger in Canada. The largest reason for this is probably that Mexican border-crossers are more used to the hassle of strict security. Because of this, any increase in customs scrutiny (which was probably relatively less severe than that on the Canadian border) would not have as large an effect on crosser’s actions. Essentially, any Mexican border crosser who would decide not to drive into the United States because of the hassle of customs procedures had probably made that decision and found another way to cross before the events of September 11th, 2001 lead to increased security and delays.

On the aggregate, there was a large and significant drop in automobile passengers crossing the border in time periods two and three. The United States needs to be sure that its post-September 11th customs policies do not alienate border-crossers from either Canada or Mexico. National security is a paramount concern, but the importance of secure borders should not allow officials at the Department of Homeland Security to forget the economic importance of land border crossings. The model in this thesis focuses on non-commercial border crossers, but the Canadian Chamber of Commerce’s complaint about “thicker, stickier and more costly” borders\(^{17}\) holds true for all types of border traffic. The goal of NAFTA was to expedite the movement of people and material

\(^{17}\) “A Fence to the North, Too”
across borders in North America. The model makes it clear that, for personal travelers at least, this expedition process has been significantly slowed.

The results of the model suggest that it is very important for the United States to take steps to expedite the process of crossing the Canadian border. While service also probably needs to be improved at the Mexican border, crossers there seem to be less affected by the new security situation. The best and cheapest way to do this is to expand the SENTRI and NEXUS systems. These systems are available at most of the largest ports at the northern and southern borders – it would be a good idea to expand them to all land ports. SENTRI and NEXUS are fee-for-service programs;\textsuperscript{18,19} in order to expand their scope and speed up cross-border trips, Customs would be wise to drop these fees in order to encourage enrollment.

Customs and the Department of Homeland Security need to recognize the important role that delays resulting from security scrutiny can play in individual’s travel decisions. As such, future policies should be designed with the idea of limited these delays whenever possible.

**Conclusion**

In the days following the September 11\textsuperscript{th} terrorist attacks, land entry to the United States shut down so tightly that auto manufacturing plants in Detroit shut down because necessary parts weren’t able to make it across the bridge from Canada. Since that time things have loosened considerably; but, formally and informally, security and scrutiny by

United States Customs and Border Patrol is much tighter than it had been ever before. In this paper, I’ve tried to show that the Customs and Border Patrol policies have lead to a downturn in the number of automobile passengers crossing both borders by highlighting the drop in crossings during two time periods when those policies were in effect.

My model would have benefited from the inclusion of a couple of variables that were unavailable because of reticence from the Department of Homeland Security and Customs and Border Patrol: average delay time at each port and the data on the presence of NEXUS or SENTRI programs. Each of these variables was unavailable; the Bureau of Transportation statistics recommended asking each port for individual delay records, but this was a hit-or-miss process. The list of ports currently running NEXUS and SENTRI is available from Customs, but the agency was unable to verify when the programs started at each port. Since these programs are used mostly at high volume ports, including a simple dummy variable controlling for the current presence of the programs would be too highly correlated with the variable for number of automobile passengers.

If Customs and Border Patrol ever releases a comprehensive set of port delay data, the model would benefit from its inclusion. The reason is simple – along with time periods two and three, the delay variable would be a measure of the effect security scrutiny has on border crosser behavior.

The significant decline in persons crossing the border in automobiles is a real and sustained reaction to the unwieldy and inefficient security apparatus now used at land ports of entry along both the Mexican and Canadian borders. Customs and Border Patrol
must reduce this trend and encourage the free flow of travel by non-threatening individuals across the border.
Sources Cited


Sources Cited (cont.)


